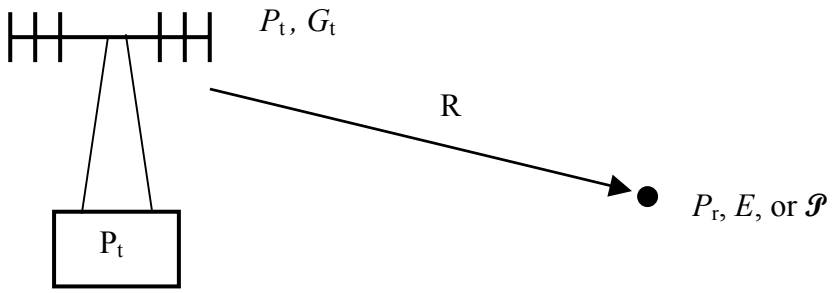

Figure 1. Illustration of an antenna in free space.

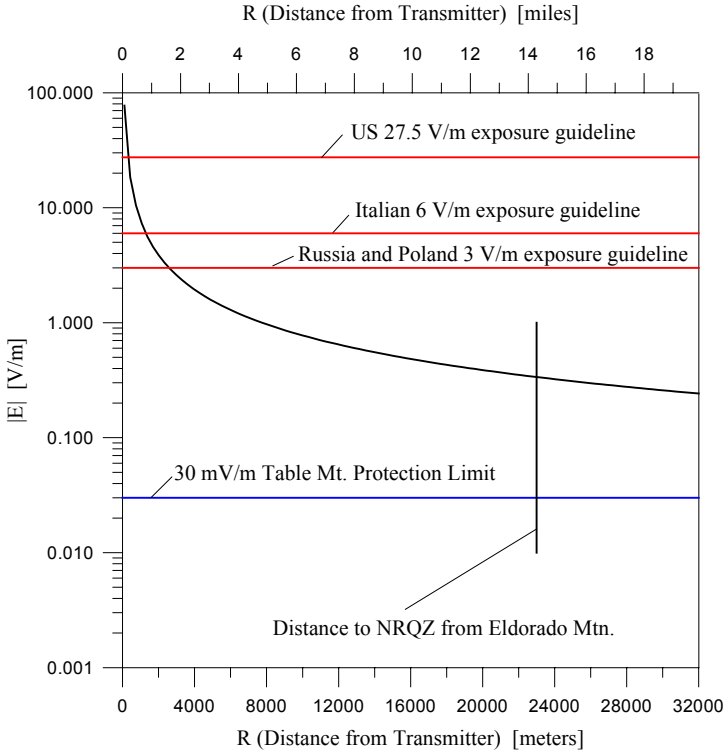

Figure 2. Magnitude of the E-field calculated for a free-space environment as a function of *R* for an EIRP of 1 MW.

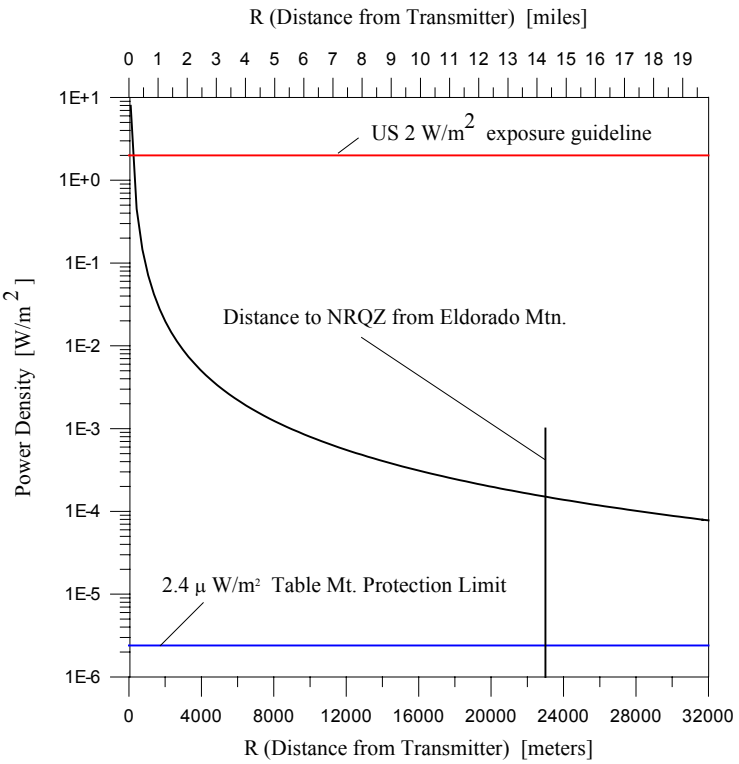

Figure 3. The power density $\mathcal{P}$ calculated for a free-space environment as a function of R for an EIRP of 1 MW.

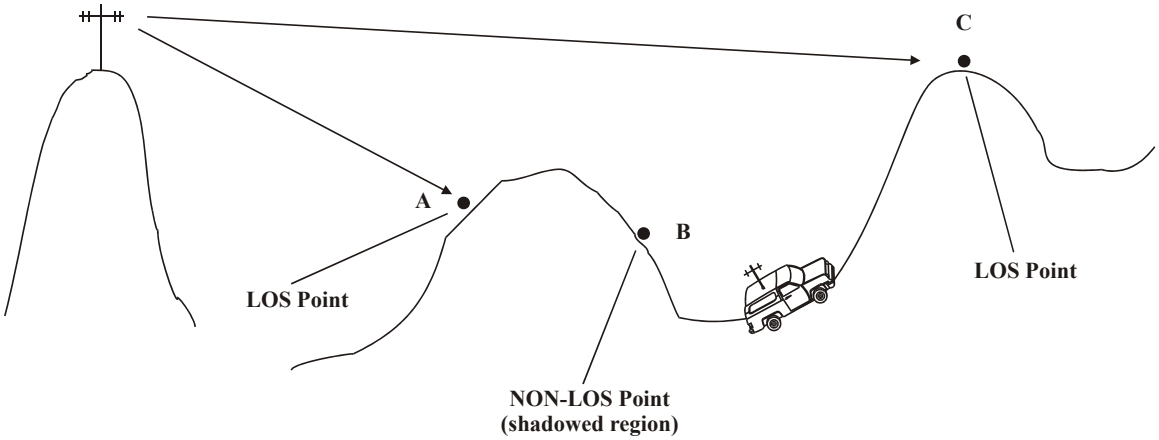

Figure 4. Illustration of a realistic propagation environment where irregular terrain features (or profiles) are present. Both a line-of-sight (LOS) path and a non-line-of-sight (non-LOS) path are shown.

Figure 5. Illustration of the RSMS with telescoping masts raised and antennas mounted for a broadband spectrum survey such as was performed at the Table Mountain NRQZ.

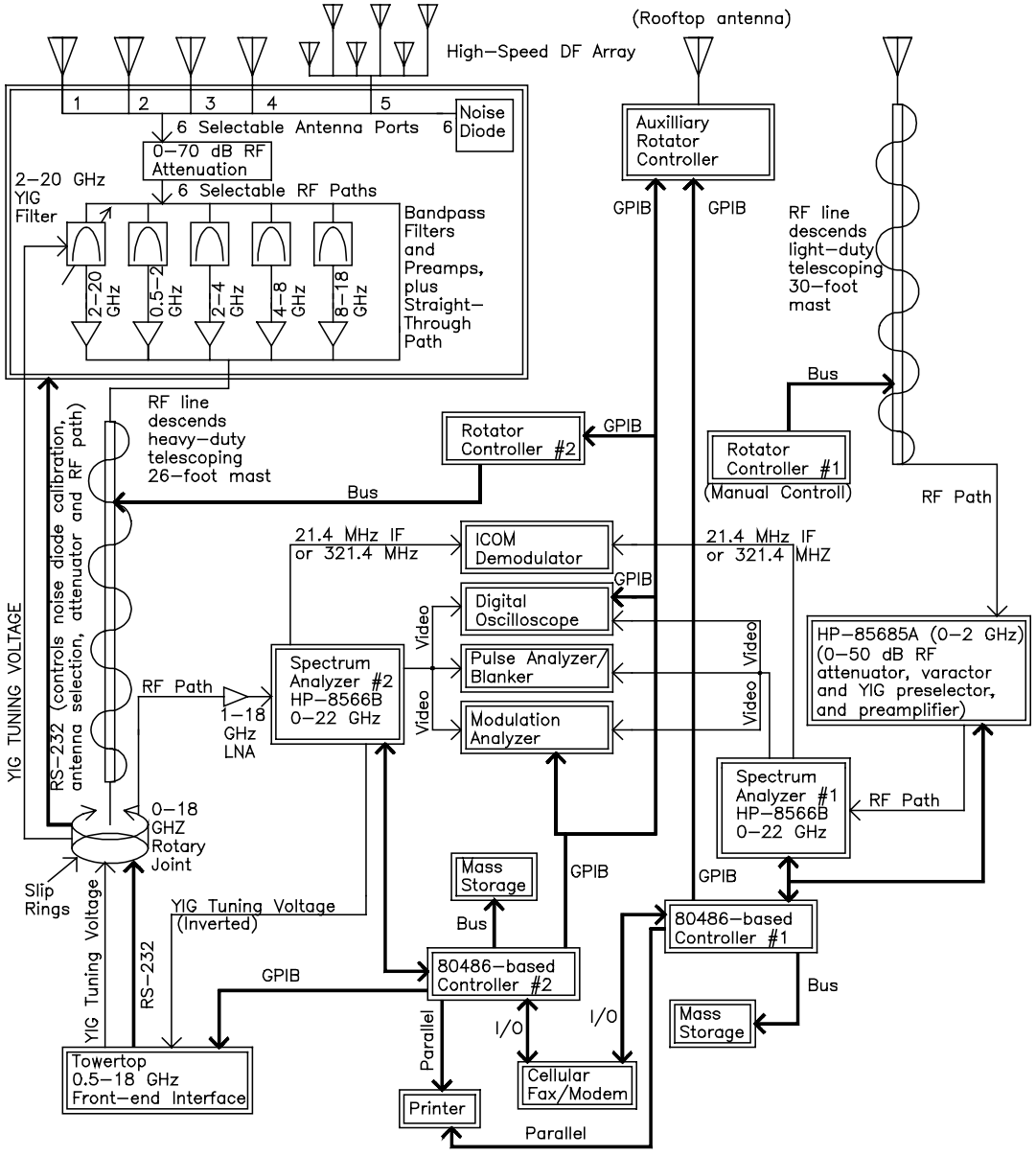

Figure 6. Block diagram of the RSMS measurement system.

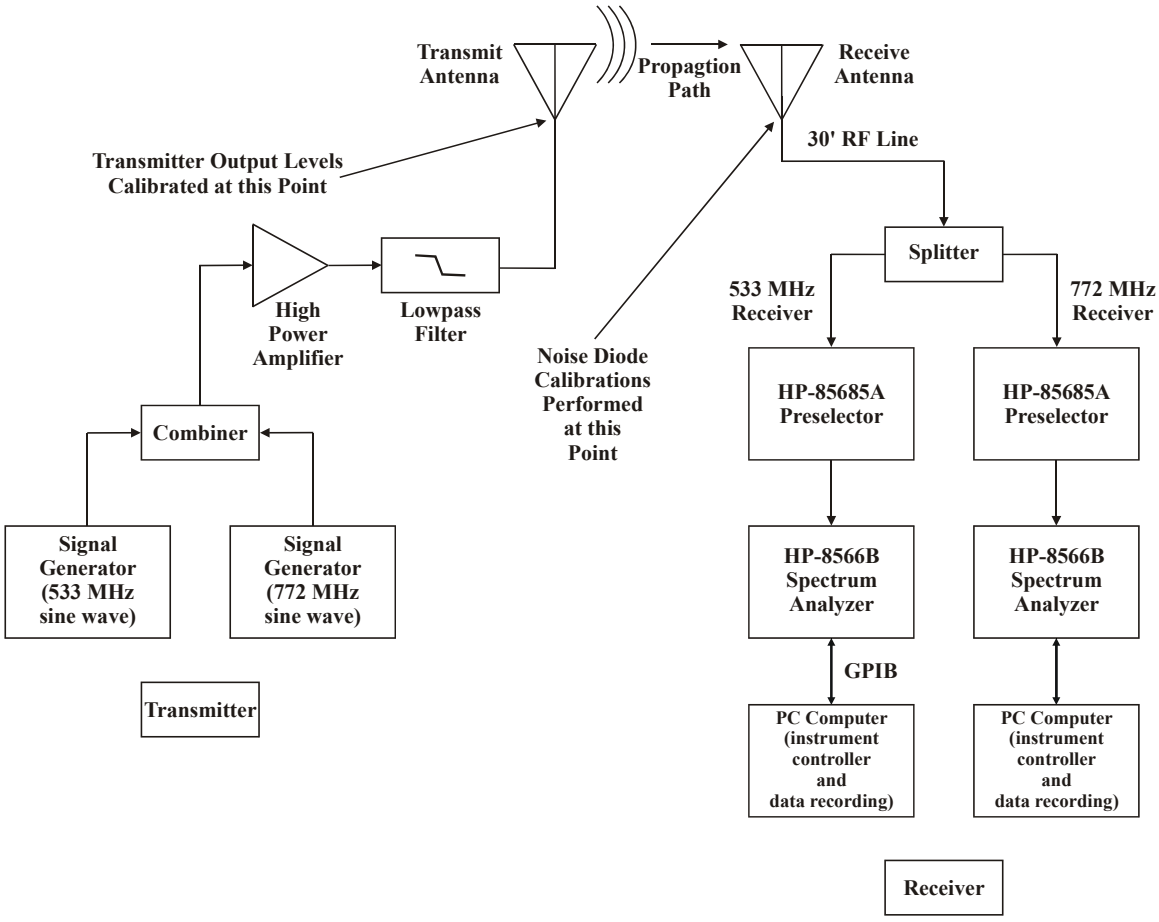

Figure 7. Block diagram of the transmitter systems on each mountaintop and the receiver measurement system.

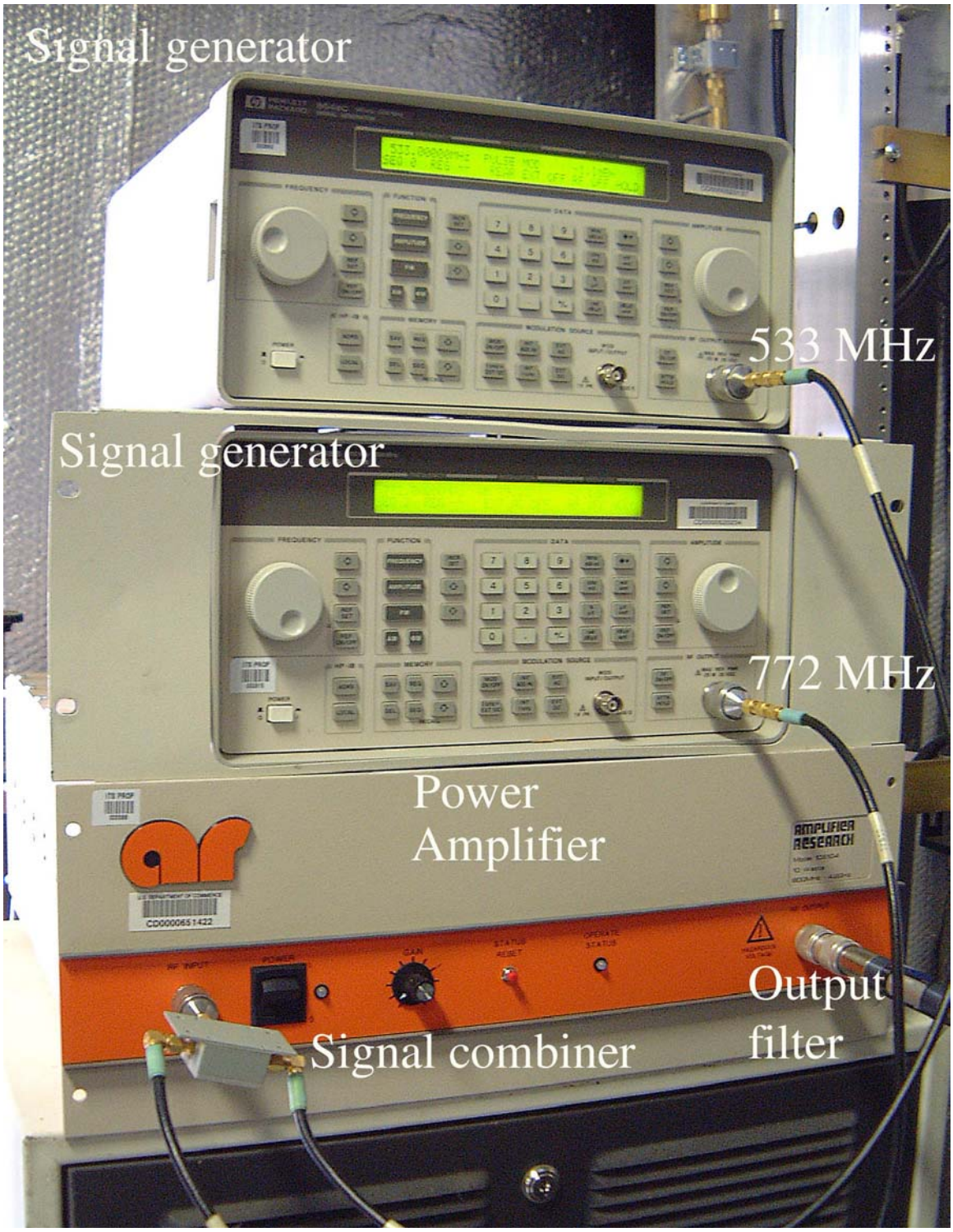

Figure 8. An annotated photograph of the transmitter system used on both mountaintops.

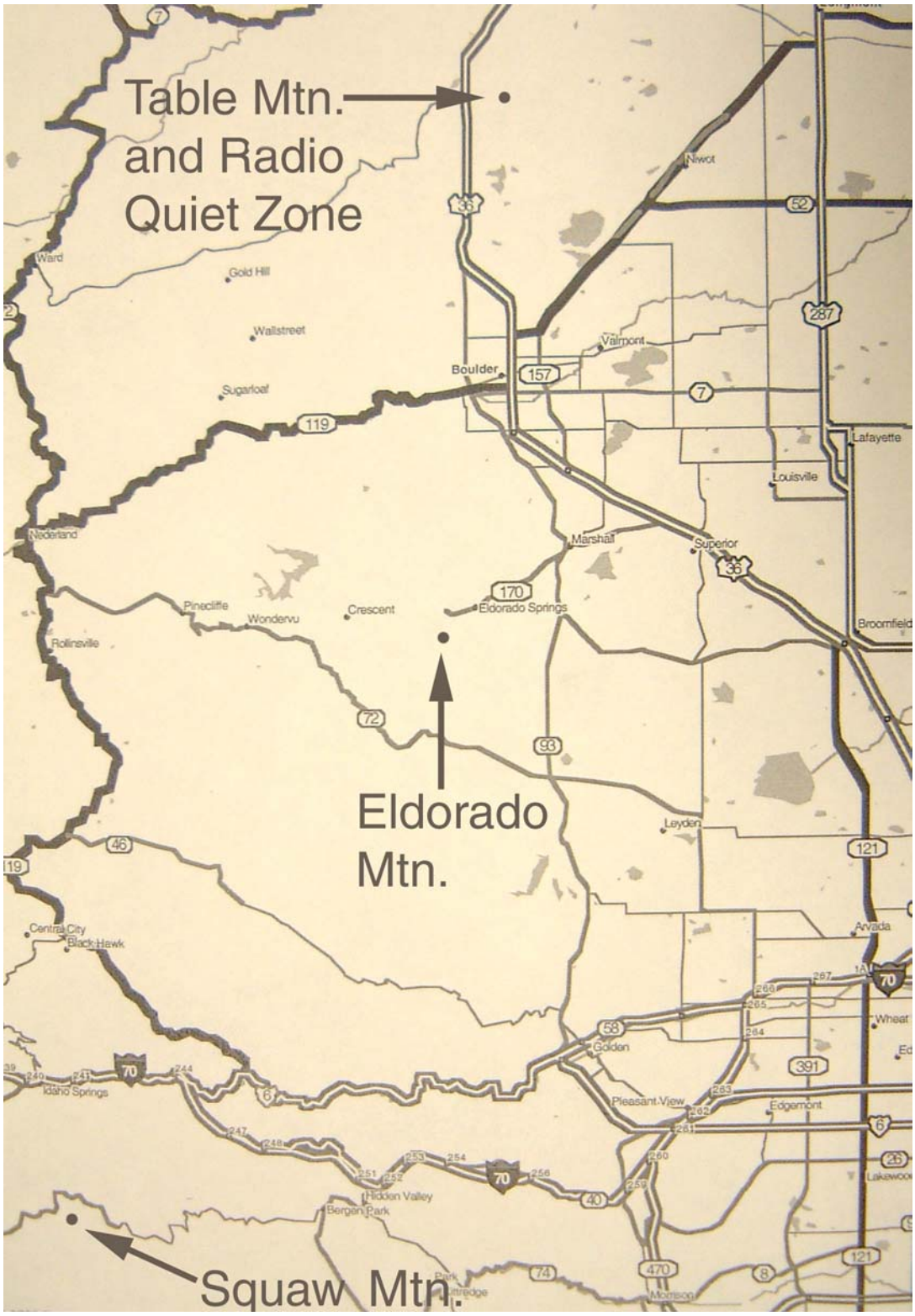

Figure 9. Map of the Denver–Boulder area showing the locations of the two proposed sites (Eldorado Mountain and Squaw Mountain) and the Table Mountain NRQZ.

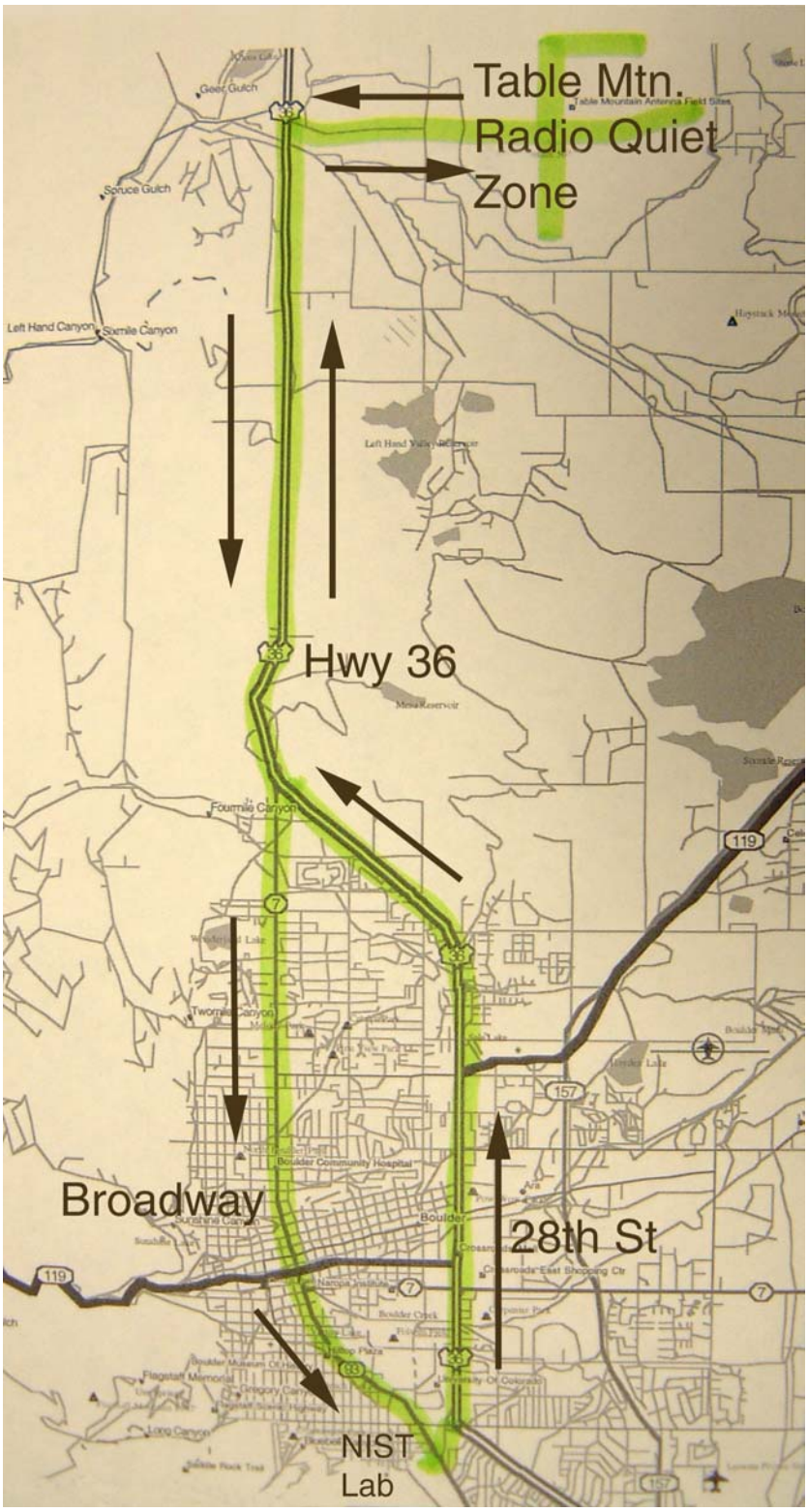

Figure 10a. Map of the 28th Street Route and the Broadway/Highway 93 Route.

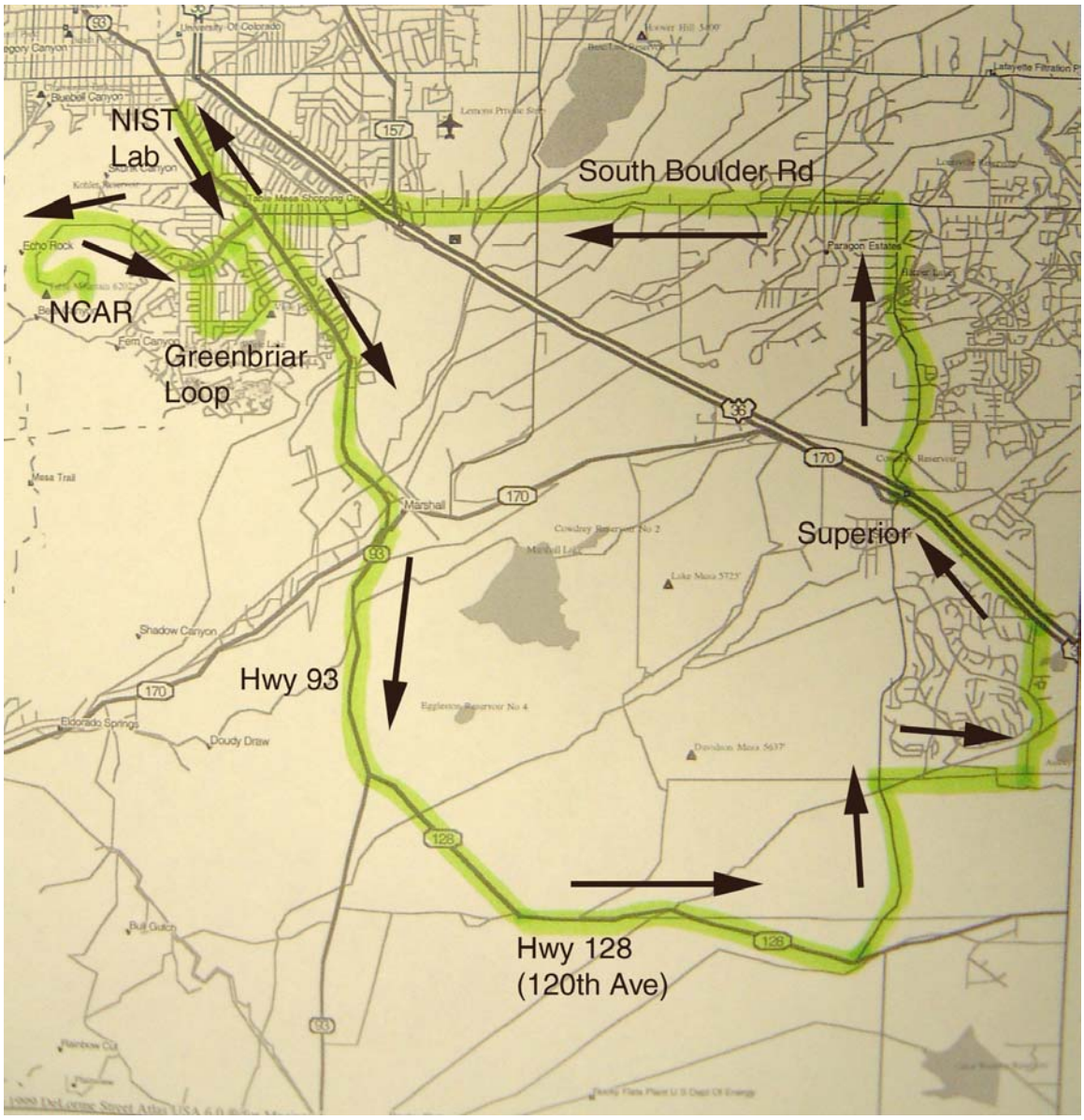

Figure 10b. Map of the McCaslin Loop, also showing the Greenbriar loop and NCAR.

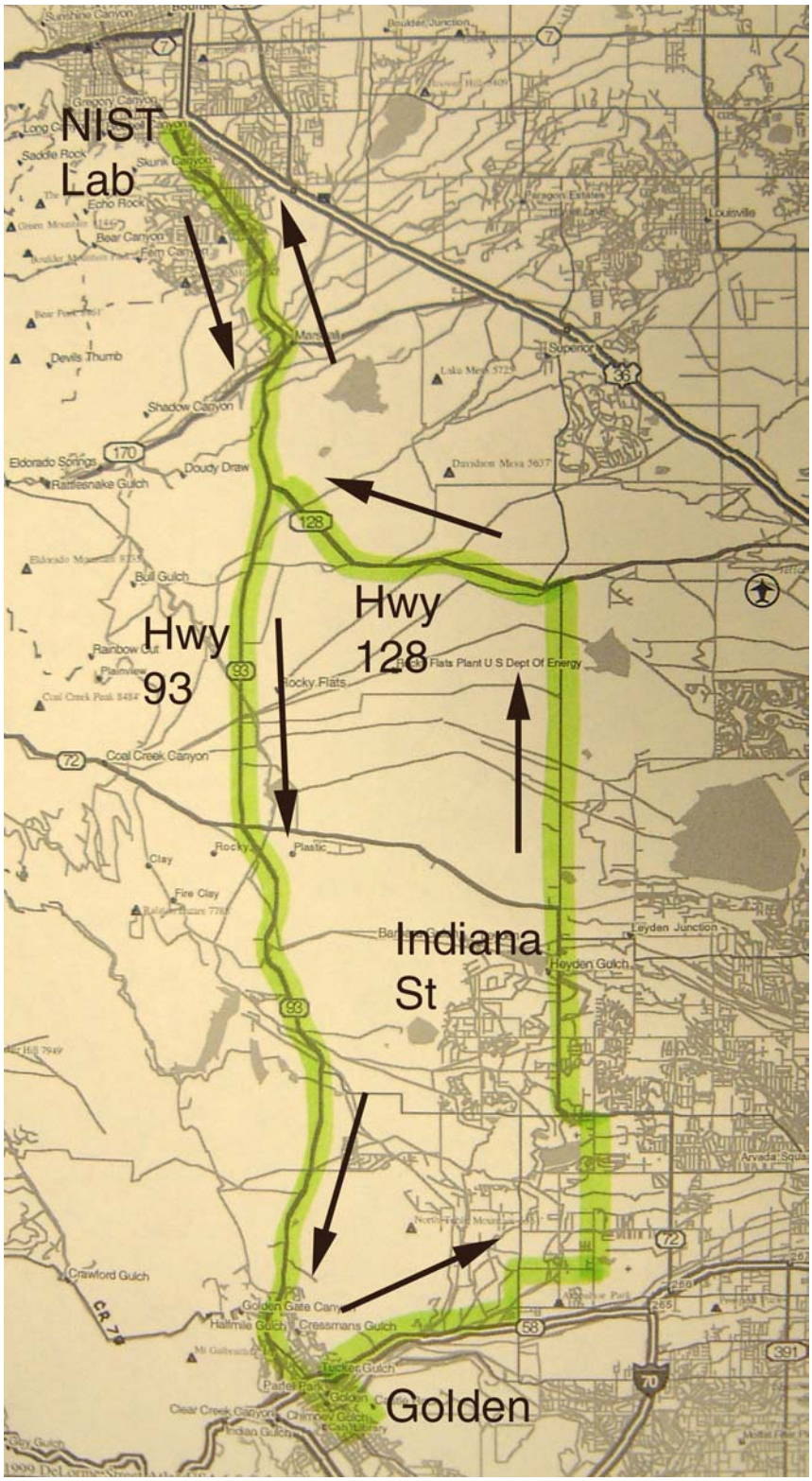

Figure 10c. Map of the Boulder-to-Golden route.

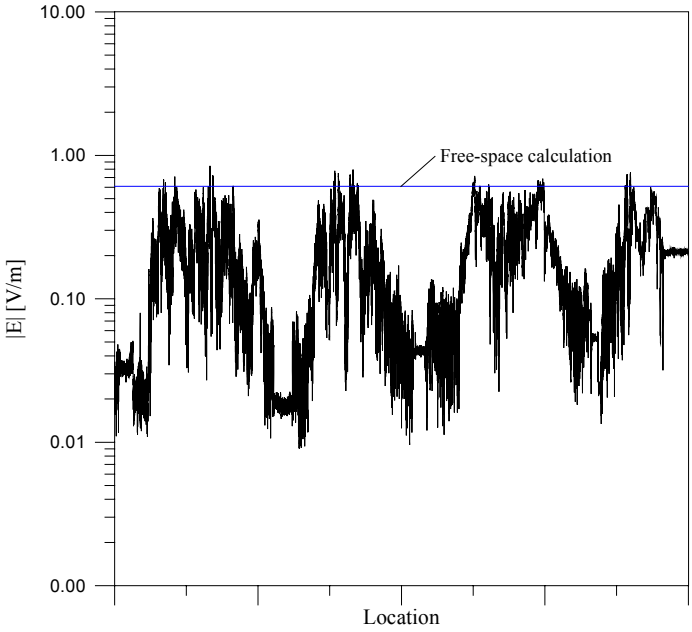

Figure 11. Measured E-field levels scaled to 1 MW EIRP at the DOC Laboratories. These results are for a transmitter on Eldorado Mountain for a frequency of 533 MHz, a transmitter height of 3.66 m (12.0 ft), and a receiver height of 2.95 m (9.68 ft).

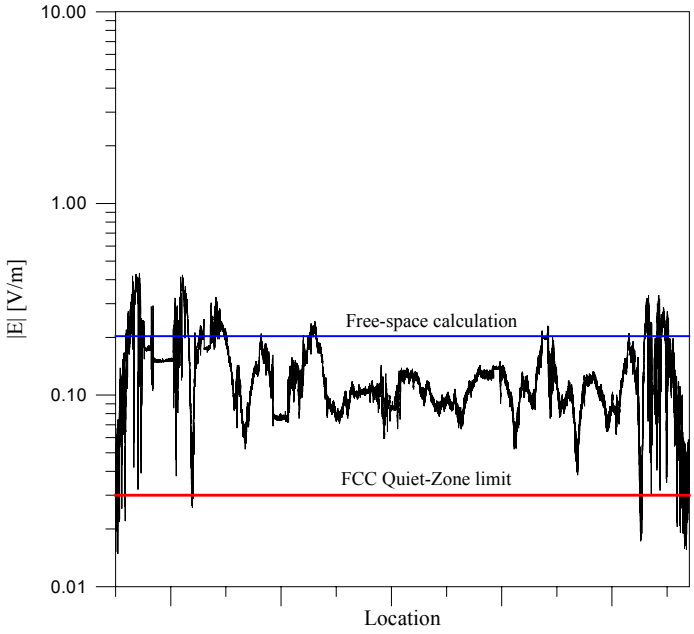

Figure 12. Measured E-field levels scaled to 1 MW EIRP at the Table Mountain NRQZ. These results are for a transmitter on Eldorado Mountain for a frequency of 533 MHz, a transmitter height of 3.66 m (12.0 ft), and a receiver height of 2.95 m (9.68 ft).

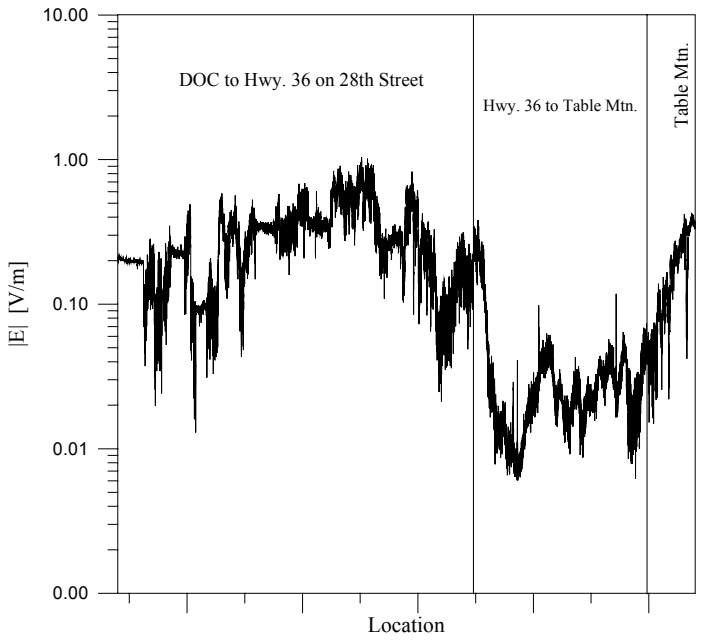

Figure 13. Measured E-field levels scaled to 1 MW EIRP from the DOC Laboratories down 28th Street to the Table Mountain NRQZ. These results are for a transmitter on Eldorado Mountain for a frequency of 533 MHz, a transmitter height of 3.66 m (12.0 ft), and a receiver height of 2.95 m (9.68 ft).

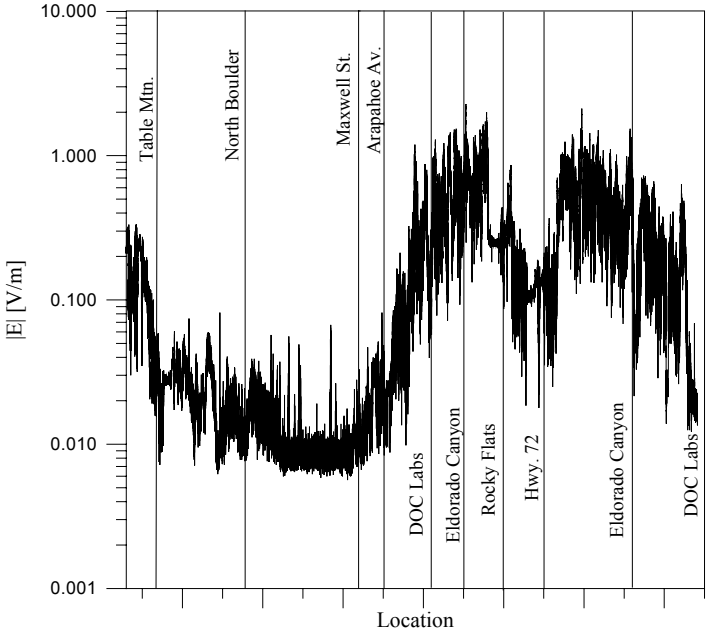

Figure 14. Measured E-field levels scaled to 1 MW EIRP from Table Mountain NRQZ to Highway 72 via Highway 36, Broadway, and Highway 93. These results are for a transmitter on Eldorado Mountain for a frequency of 533 MHz, a transmitter height of 3.66 m (12.0 ft), and a receiver height of 2.95 m (9.68 ft).

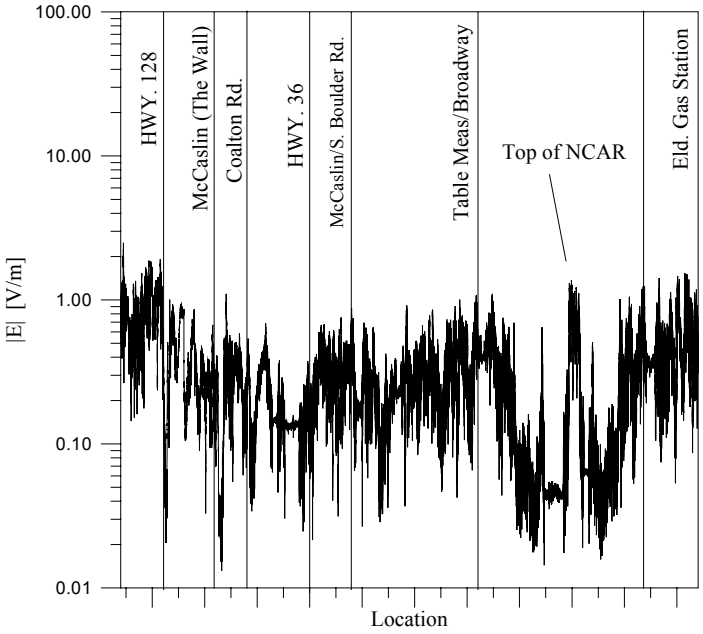

Figure 15. Measured E-field levels scaled to 1 MW EIRP on the McCaslin loop. These results are for a transmitter on Eldorado Mountain for a frequency of 533 MHz, a transmitter height of 3.66 m (12.0 ft), and a receiver height of 2.95 m (9.68 ft).

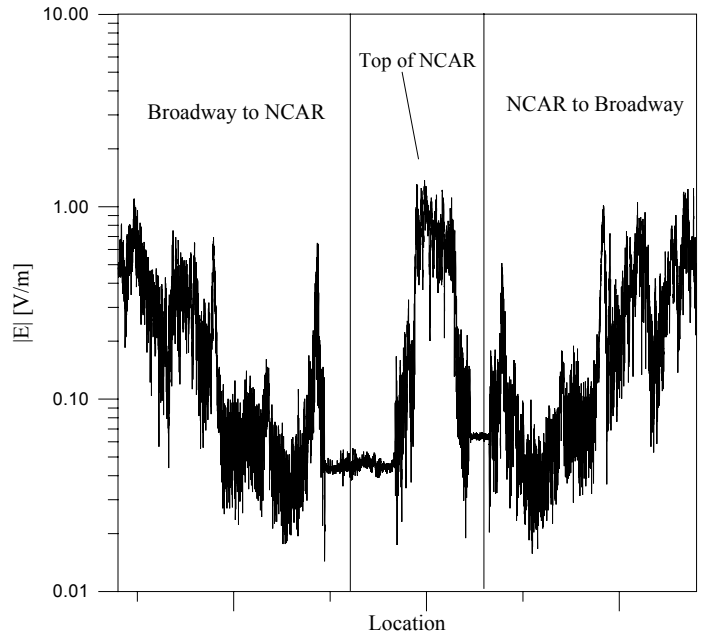

Figure 16. Measured E-field levels scaled to 1 MW EIRP at the NCAR facility at the top of Table Mesa. These results are for a transmitter on Eldorado Mountain for a frequency of 533 MHz, a transmitter height of 3.66 m (12.0 ft), and a receiver height of 2.95 m (9.68 ft).

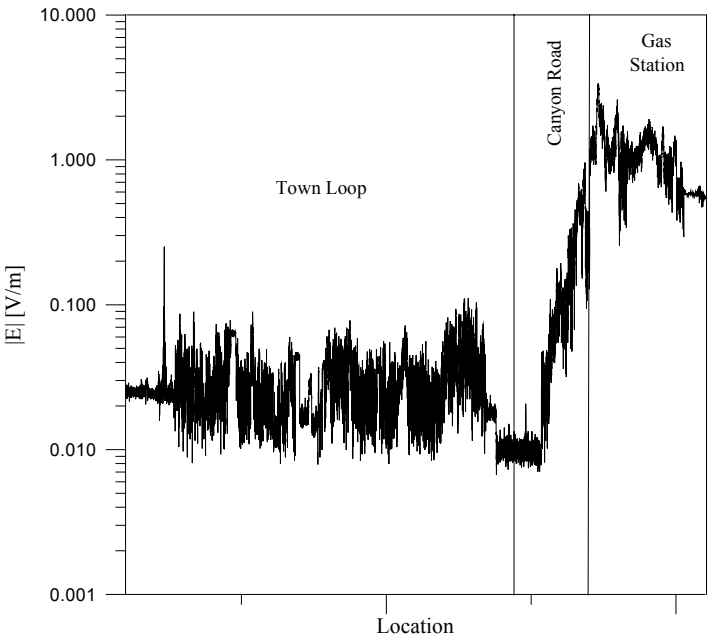

Figure 17. Measured E-field levels scaled to 1 MW EIRP in Eldorado Canyon. These results are for a transmitter on Eldorado Mountain for a frequency of 533 MHz, a transmitter height of 3.66 m (12.0 ft), and a receiver height of 2.95 m (9.68 ft).

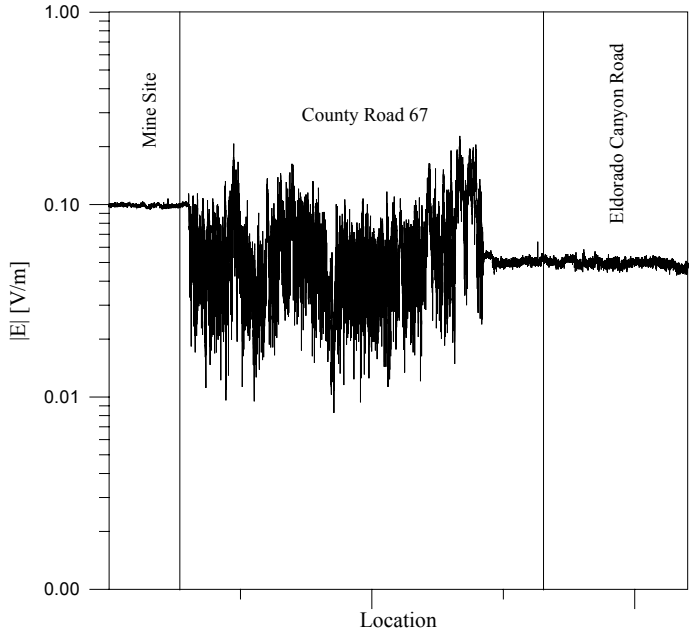

Figure 18. Measured E-field levels scaled to 1 MW EIRP on County Road 67. These results are for a transmitter on Eldorado Mountain for a frequency of 533 MHz, a transmitter height of 3.66 m (12.0 ft), and a receiver height of 2.95 m (9.68 ft).

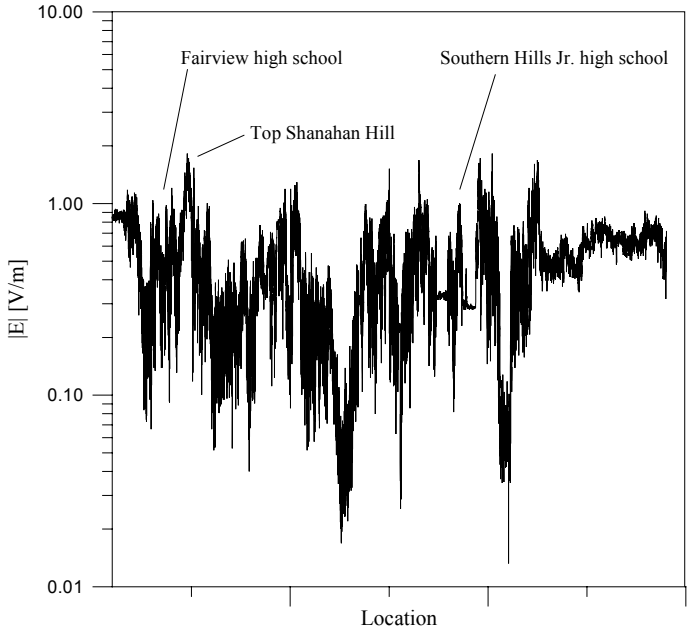

Figure 19. Measured E-field levels scaled to 1 MW EIRP on Greenbriar loop. These results are for a transmitter on Eldorado Mountain for a frequency of 533 MHz, a transmitter height of 3.66 m (12.0 ft), and a receiver height of 2.95 m (9.68 ft).

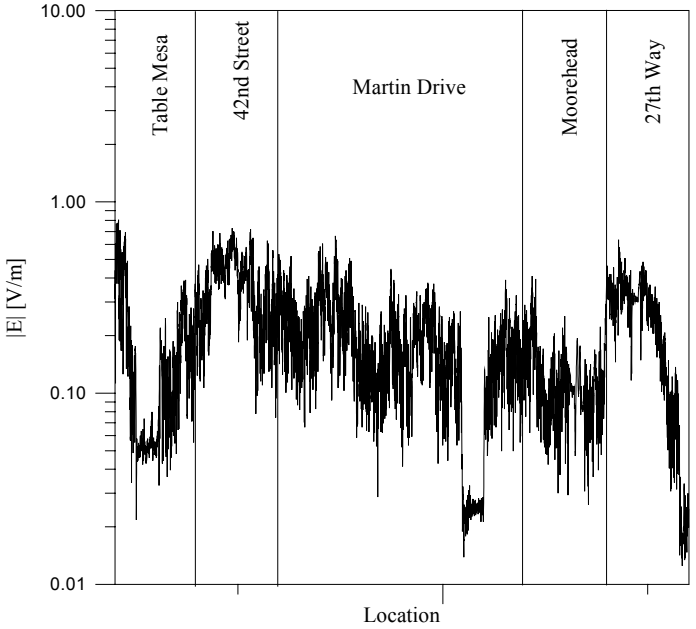

Figure 20. Measured E-field levels scaled to 1 MW EIRP in the Martin Acres neighborhood. These results are for a transmitter on Eldorado Mountain for a frequency of 533 MHz, a transmitter height of 3.66 m (12.0 ft), and a receiver height of 2.95 m (9.68 ft).

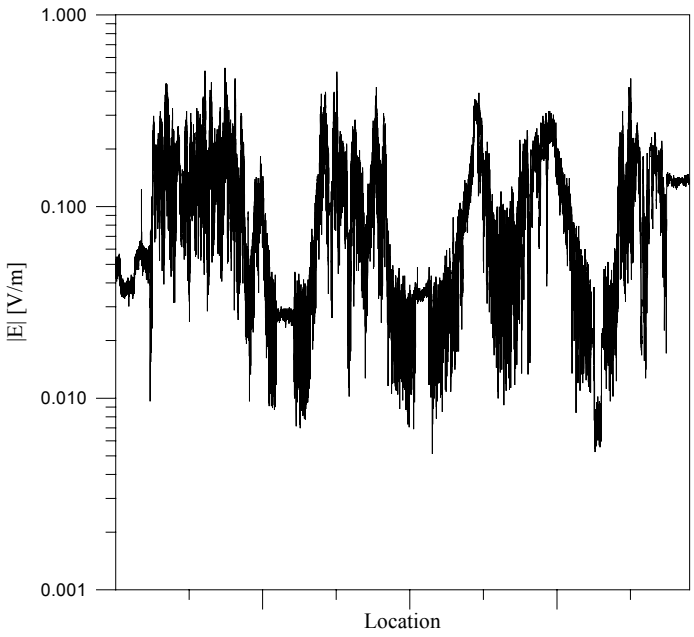

Figure 21. Measured E-field levels scaled to 1 MW EIRP at the DOC Laboratories. These results are for a transmitter on Eldorado Mountain for a frequency of 772 MHz, a transmitter height of 3.66 m (12.0 ft), and a receiver height of 2.95 m (9.68 ft).

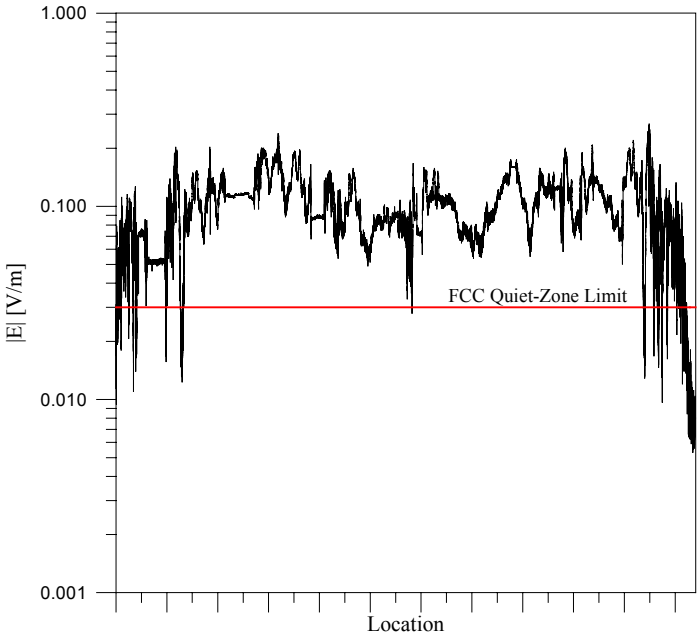

Figure 22. Measured E-field levels scaled to 1 MW EIRP at the Table Mountain NRQZ. These results are for a transmitter on Eldorado Mountain for a frequency of 772 MHz, a transmitter height of 3.66 m (12.0 ft), and a receiver height of 2.95 m (9.68 ft).

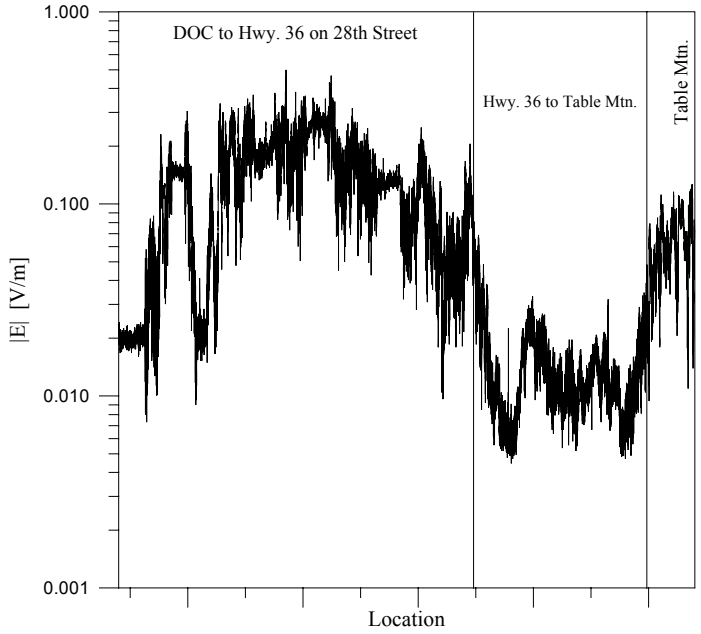

Figure 23. Measured E-field levels scaled to 1 MW EIRP from the DOC Laboratories down 28th Street to the Table Mountain NRQZ. These results are for a transmitter on Eldorado Mountain for a frequency of 772 MHz, a transmitter height of 3.66 m (12.0 ft), and a receiver height of 2.95 m (9.68 ft).

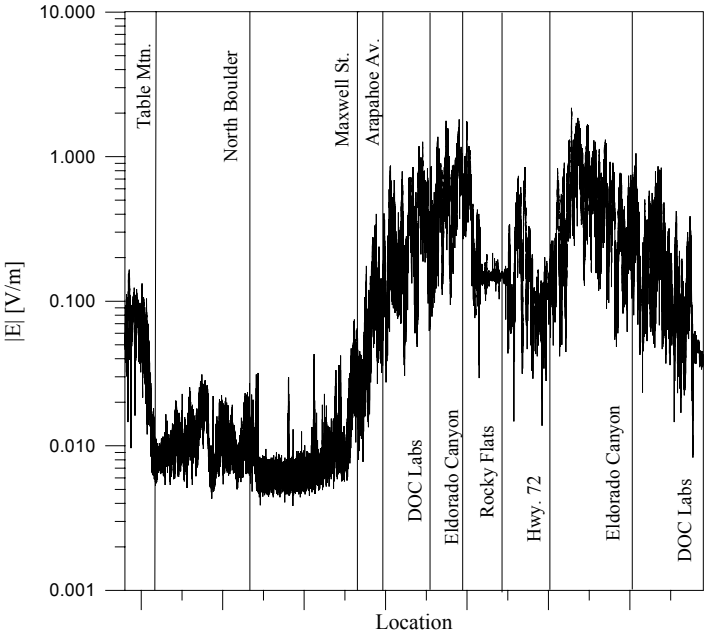

Figure 24. Measured E-field levels scaled to 1 MW EIRP from Table Mountain NRQZ to Highway 72 via Highway 36, Broadway, and Highway 93. These results are for a transmitter on Eldorado Mountain for a frequency of 772 MHz, a transmitter height of 3.66 m (12.0 ft), and a receiver height of 2.95 m (9.68 ft).

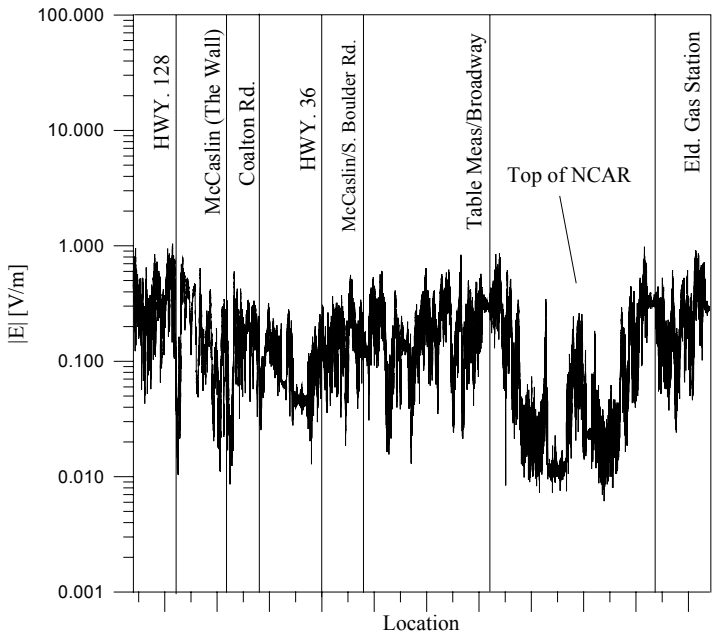

Figure 25. Measured E-field levels scaled to 1 MW EIRP on the McCaslin loop. These results are for a transmitter on Eldorado Mountain for a frequency of 772 MHz, a transmitter height of 3.66 m (12.0 ft), and a receiver height of 2.95 m (9.68 ft).

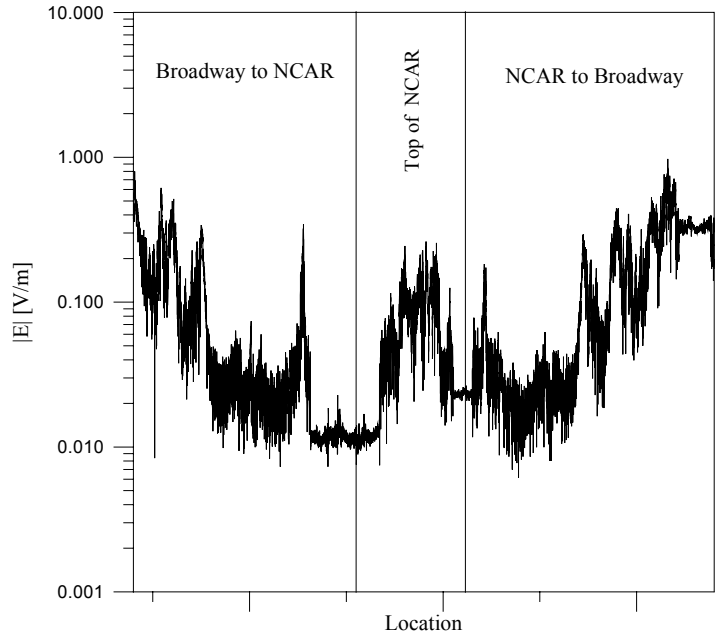

Figure 26. Measured E-field levels scaled to 1 MW EIRP at the NCAR facility at the top of Table Mesa. These results are for a transmitter on Eldorado Mountain for a frequency of 772 MHz, a transmitter height of 3.66 m (12.0 ft), and a receiver height of 2.95 m (9.68 ft).

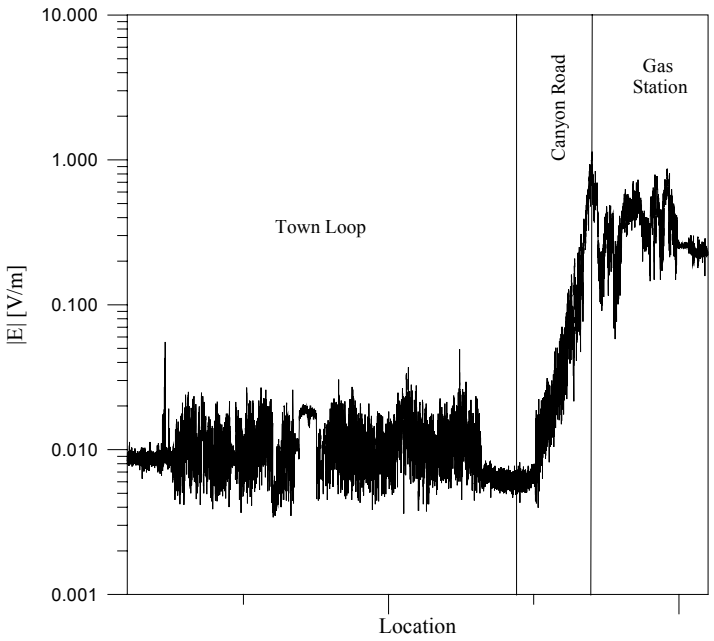

Figure 27. Measured E-field levels scaled to 1 MW EIRP in Eldorado Canyon. These results are for a transmitter on Eldorado Mountain for a frequency of 772 MHz, a transmitter height of 3.66 m (12.0 ft), and a receiver height of 2.95 m (9.68 ft).

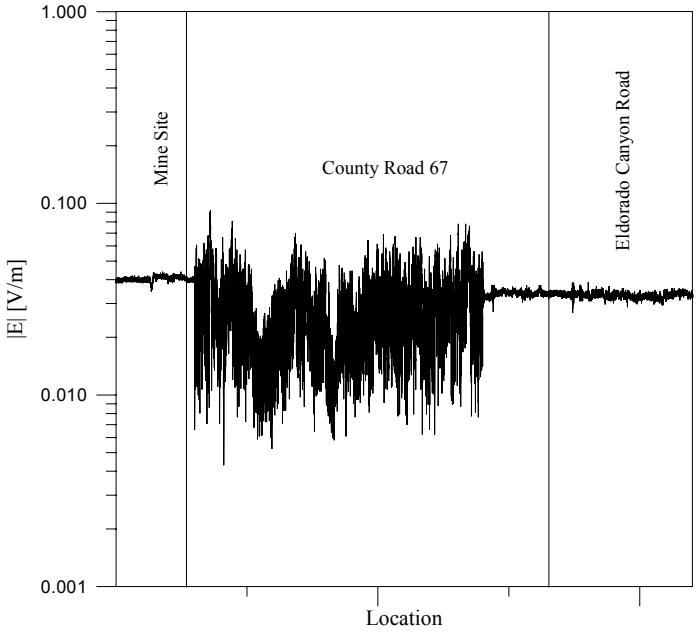

Figure 28. Measured E-field levels scaled to 1 MW EIRP on County Road 67. These results are for a transmitter on Eldorado Mountain for a frequency of 772 MHz, a transmitter height of 3.66 m (12.0 ft), and a receiver height of 2.95 m (9.68 ft).

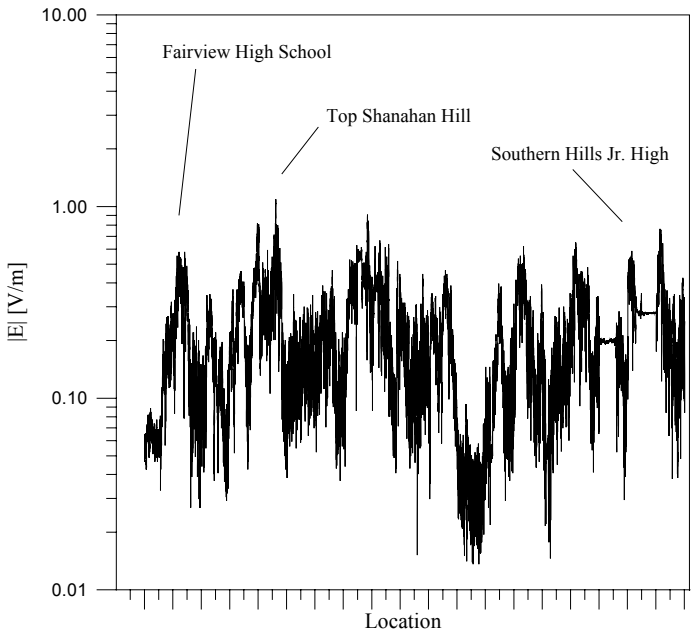

Figure 29. Measured E-field levels scaled to 1 MW EIRP on Greenbriar loop. These results are for a transmitter on Eldorado Mountain for a frequency of 772 MHz, a transmitter height of 3.66 m (12.0 ft), and a receiver height of 2.95 m (9.68 ft).

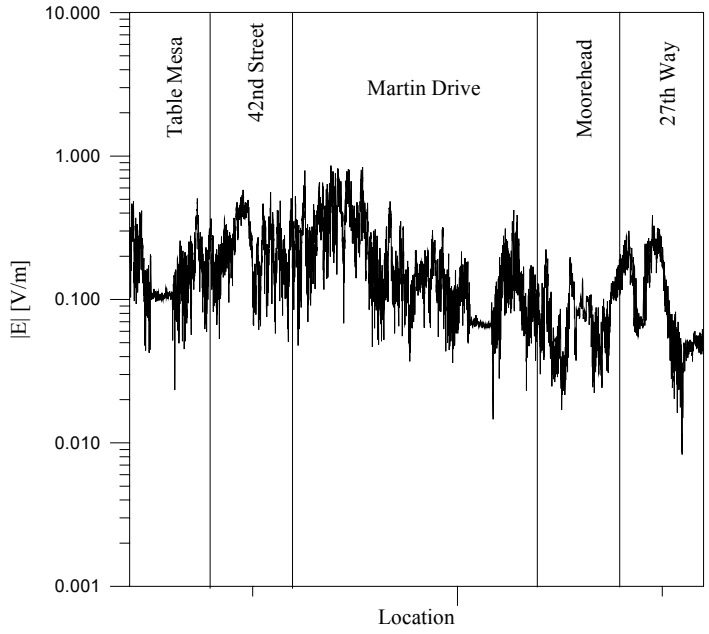

Figure 30. Measured E-field levels scaled to 1 MW EIRP in the Martin Acres neighborhood. These results are for a transmitter on Eldorado Mountain for a frequency of 772 MHz, a transmitter height of 3.66 m (12.0 ft), and a receiver height of 2.95 m (9.68 ft).

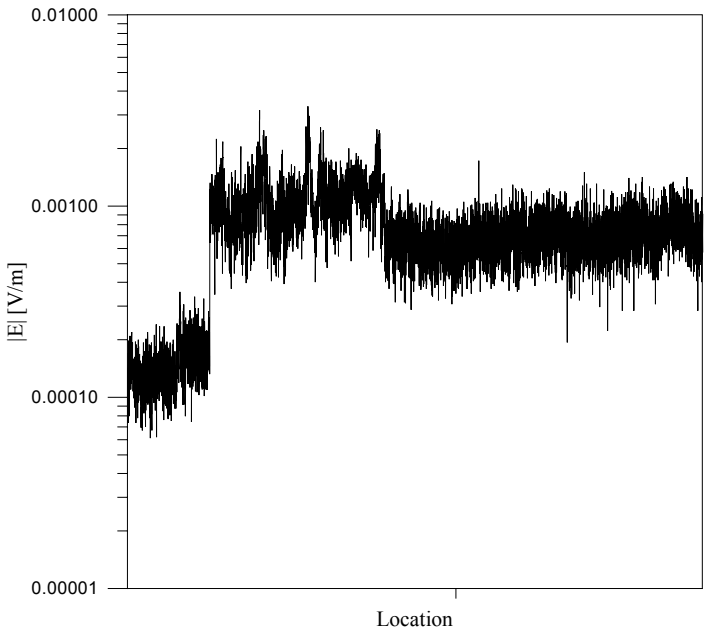

Figure 31. Measured E-field levels scaled to 1 MW EIRP at the DOC Laboratories. These results are for a transmitter on Squaw Mountain for a frequency of 533 MHz, a transmitter height of 8.2 m (26.9 ft), and a receiver height of 2.95 m (9.68 ft).

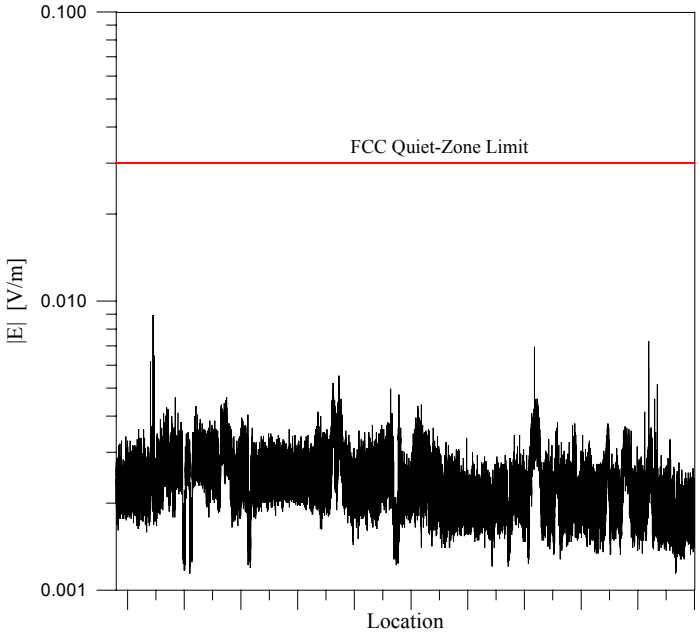

Figure 32. Measured E-field levels scaled to 1 MW EIRP at the Table Mountain NRQZ. These results are for a transmitter on Squaw Mountain for a frequency of 533 MHz, a transmitter height of 8.2 m (26.9 ft), and a receiver height of 2.95 m (9.68 ft).

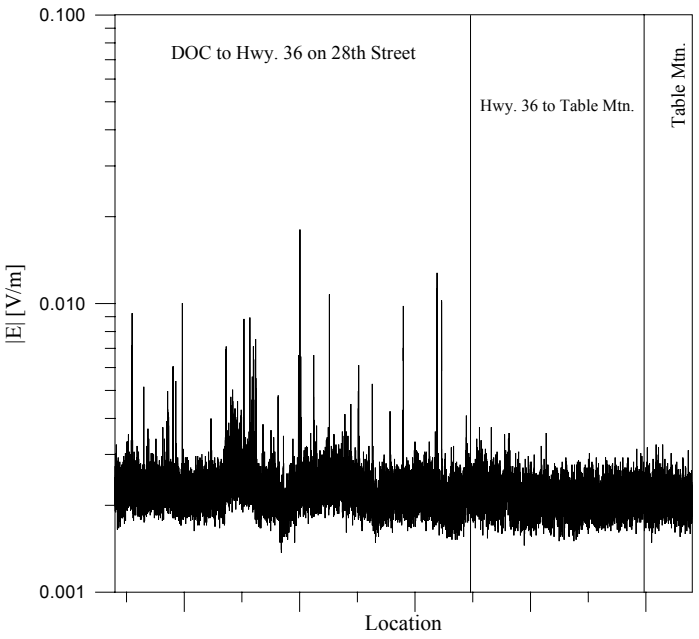

Figure 33. Measured E-field levels scaled to 1 MW EIRP from the DOC Laboratories down 28th Street to the Table Mountain NRQZ. These results are for a transmitter on Squaw Mountain for a frequency of 533 MHz, a transmitter height of 8.2 m (26.9 ft), and a receiver height of 2.95 m (9.68 ft).

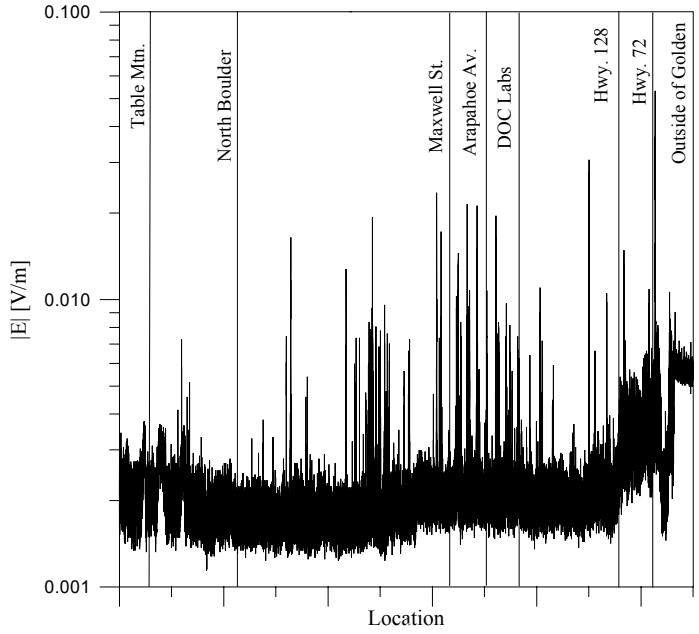

Figure 34. Measured E-field levels scaled to 1 MW EIRP from the Table Mountain NRQZ to Highway 72 via Highway 36, Broadway, and Highway 93. These results are for a transmitter on Squaw Mountain for a frequency of 533 MHz, a transmitter height of 8.2 m (26.9 ft), and a receiver height of 2.95 m (9.68 ft).

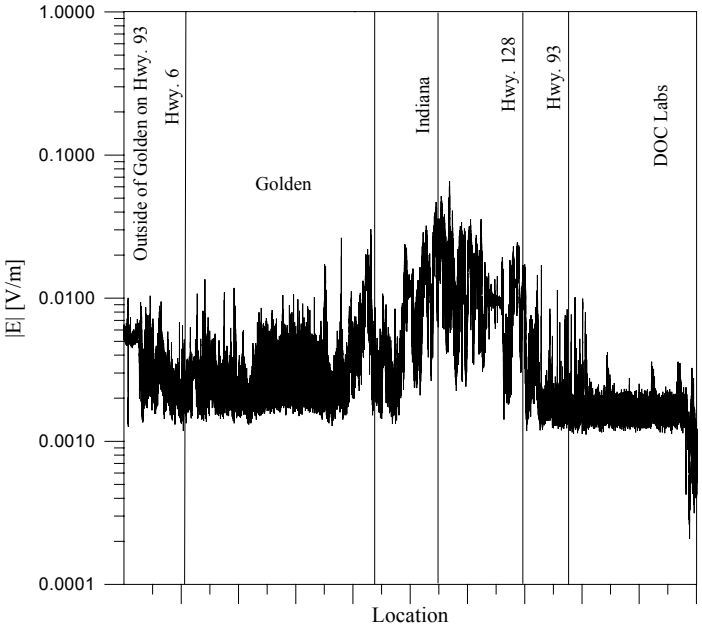

Figure 35. Measured E-field levels scaled to 1 MW EIRP on the Boulder/Golden loop. These results are for a transmitter on Squaw Mountain for a frequency of 533 MHz, a transmitter height of 8.2 m (26.9 ft), and a receiver height of 2.95 m (9.68 ft).

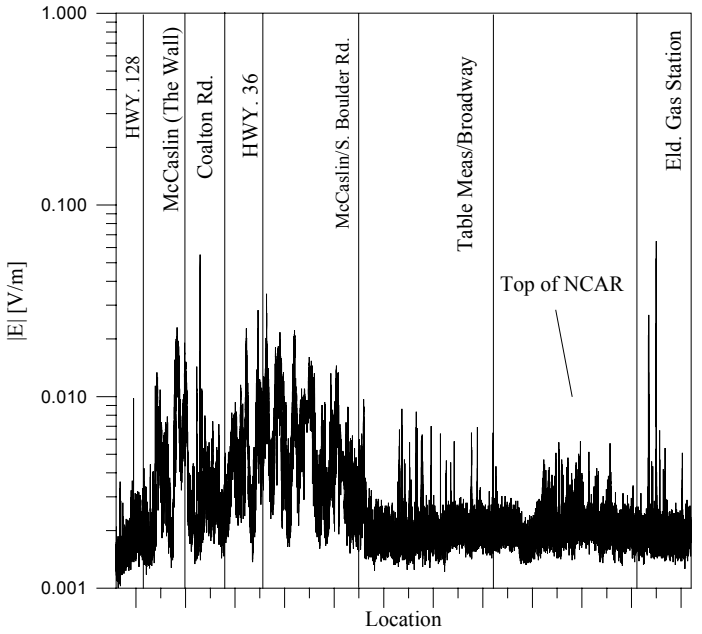

Figure 36. Measured E-field levels scaled to 1 MW EIRP on the McCaslin loop. These results are for a transmitter on Squaw Mountain for a frequency of 533 MHz, a transmitter height of 8.2 m (26.9 ft), and a receiver height of 2.95 m (9.68 ft).

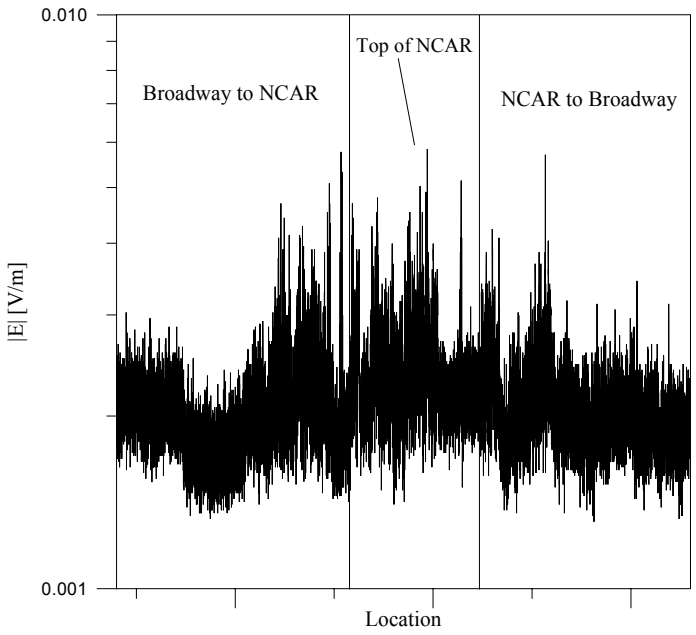

Figure 37. Measured E-field levels scaled to 1 MW EIRP at the NCAR facility at the top of Table Mesa. These results are for a transmitter on Squaw Mountain for a frequency of 533 MHz, a transmitter height of 8.2 m (26.9 ft), and a receiver height of 2.95 m (9.68 ft).

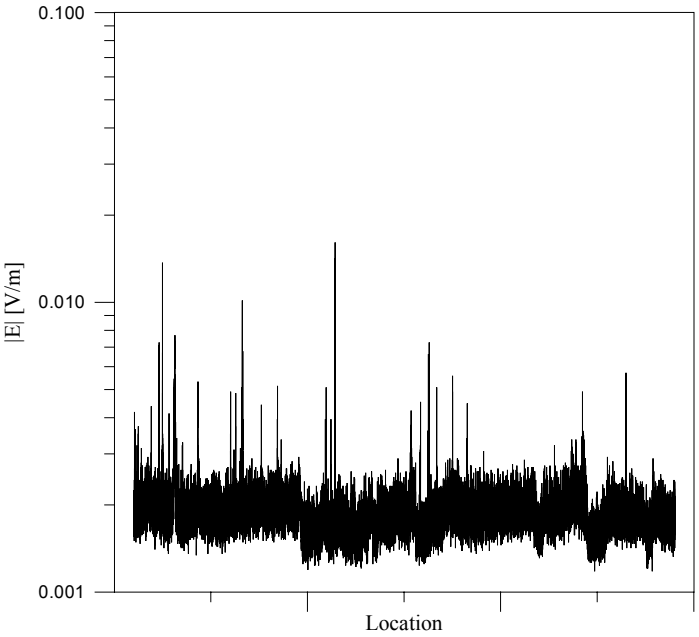

Figure 38. Measured E-field levels scaled to 1 MW EIRP on Greenbriar loop. These results are for a transmitter on Squaw Mountain for a frequency of 533 MHz, a transmitter height of 8.2 m (26.9 ft), and a receiver height of 2.95 m (9.68 ft).

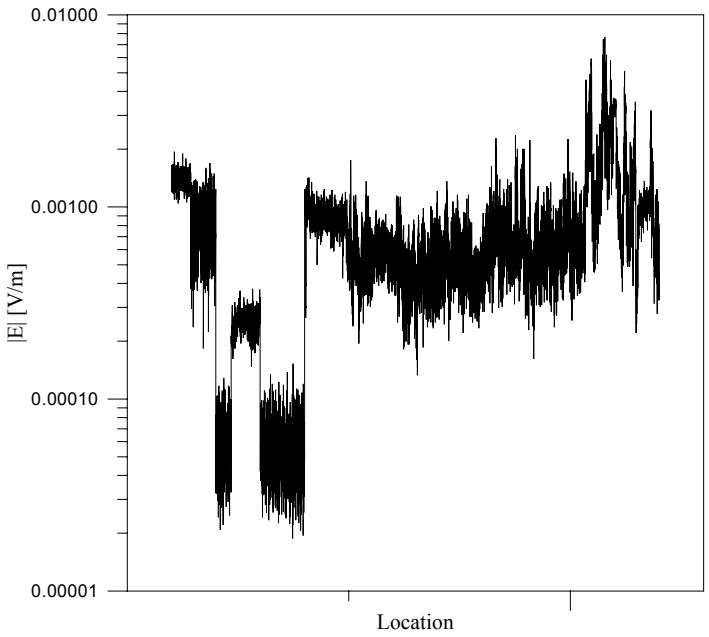

Figure 39. Measured E-field levels scaled to 1 MW EIRP at the DOC Laboratories. These results are for a transmitter on Squaw Mountain for a frequency of 772 MHz, a transmitter height of 8.2 m (26.9 ft), and a receiver height of 2.95 m (9.68 ft).

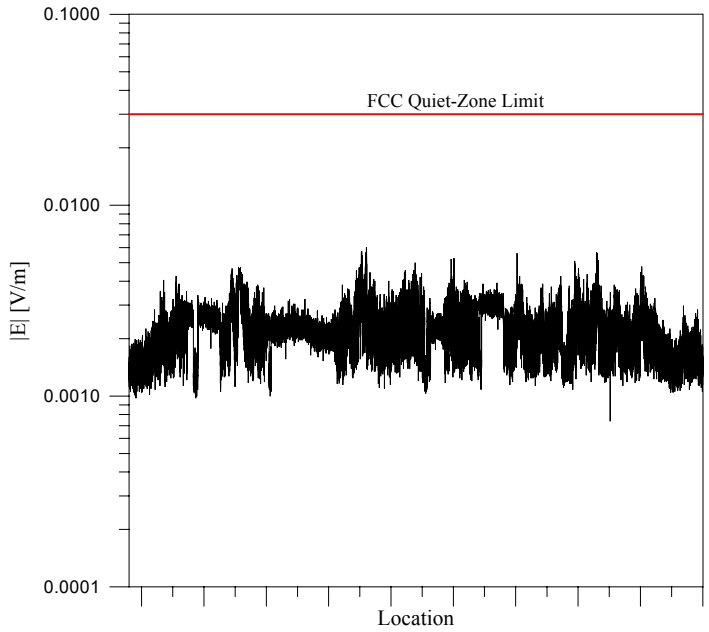

Figure 40. Measured E-field levels scaled to 1 MW EIRP at the Table Mountain NRQZ. These results are for a transmitter on Squaw Mountain for a frequency of 772 MHz, a transmitter height of 8.2 m (26.9 ft), and a receiver height of 2.95 m (9.68 ft).

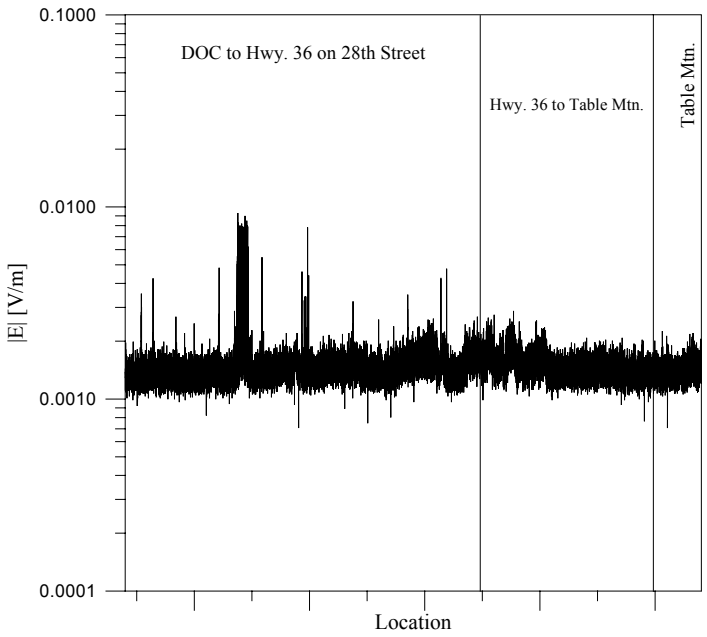

Figure 41. Measured E-field levels scaled to 1 MW EIRP from the DOC Laboratories down 28th Street to the Table Mountain NRQZ. These results are for a transmitter on Squaw Mountain for a frequency of 772 MHz, a transmitter height of 8.2 m (26.9 ft), and a receiver height of 2.95 m (9.68 ft).

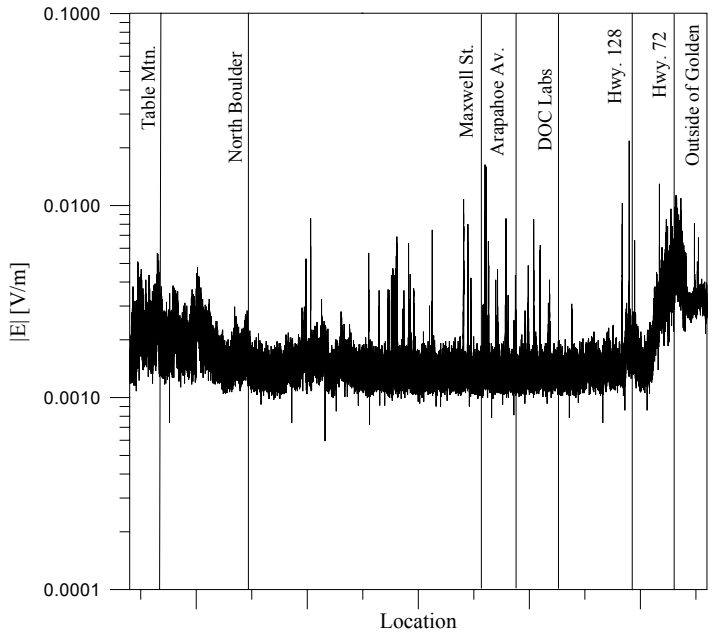

Figure 42. Measured E-field levels scaled to 1 MW EIRP from the Table Mountain NRQZ to Highway 72 via Highway 36, Broadway, and Highway 93. These results are for a transmitter on Squaw Mountain for a frequency of 772 MHz, a transmitter height of 8.2 m (26.9 ft), and a receiver height of 2.95 m (9.68 ft).

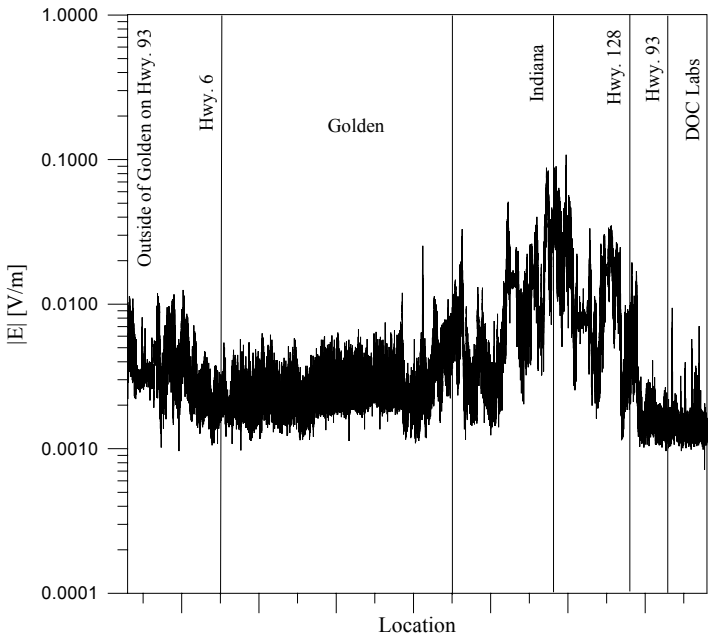

Figure 43. Measured E-field levels scaled to 1 MW EIRP on the Boulder/Golden loop. These results are for a transmitter on Squaw Mountain for a frequency of 772 MHz, a transmitter height of 8.2 m (26.9 ft), and a receiver height of 2.95 m (9.68 ft).

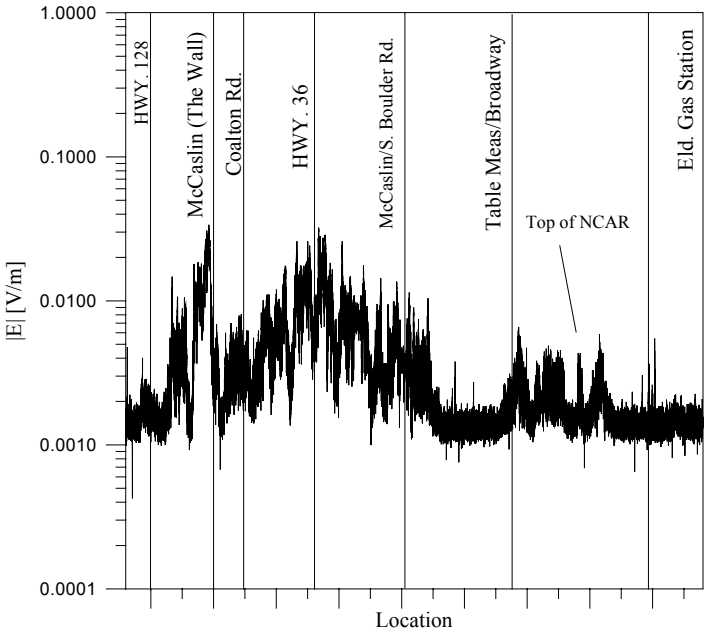

Figure 44. Measured E-field levels scaled to 1 MW EIRP on the McCaslin loop. These results are for a transmitter on Squaw Mountain for a frequency of 772 MHz, a transmitter height of 8.2 m (26.9 ft), and a receiver height of 2.95 m (9.68 ft).

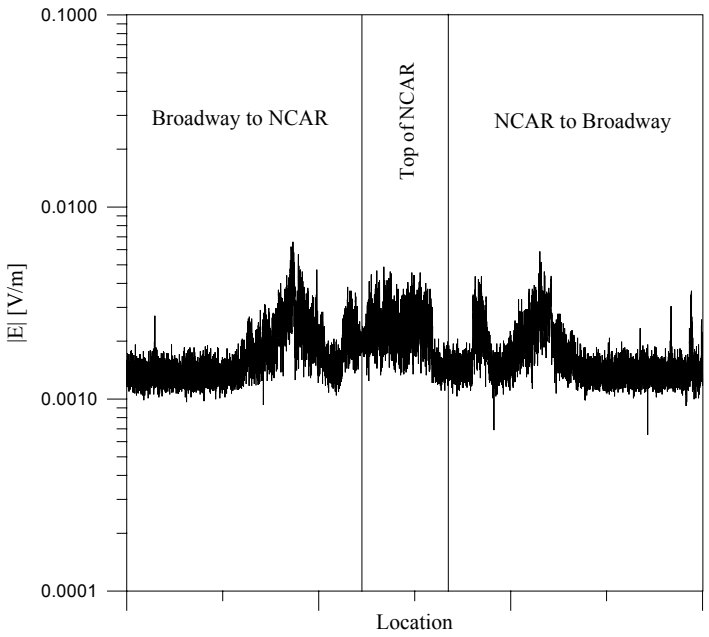

Figure 45. Measured E-field levels scaled to 1 MW EIRP at the NCAR facility at the top of Table Mesa. These results are for a transmitter on Squaw Mountain for a frequency of 772 MHz, a transmitter height of 8.2 m (26.9 ft), and a receiver height of 2.95 m (9.68 ft).

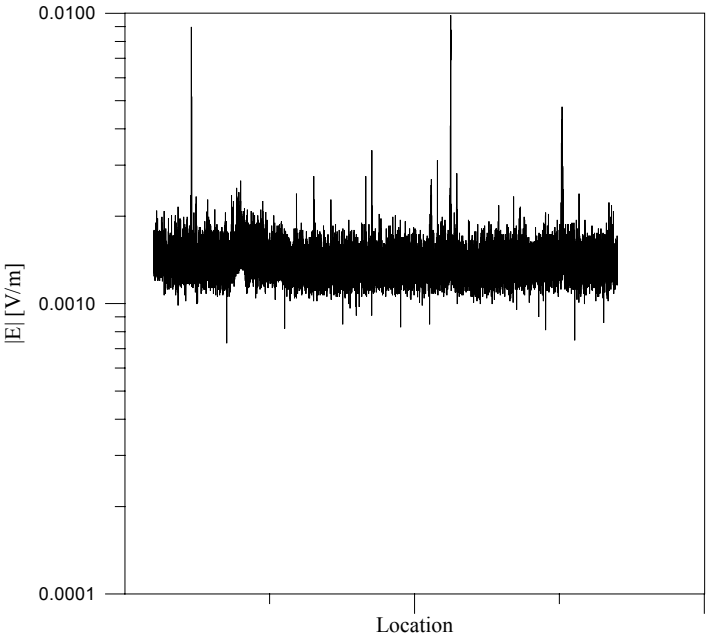

Figure 46. Measured E-field levels scaled to 1 MW EIRP on the Greenbriar loop. These results are for a transmitter on Squaw Mountain for a frequency of 772 MHz, a transmitter height of 8.2 m (26.9 ft), and a receiver height of 2.95 m (9.68 ft).

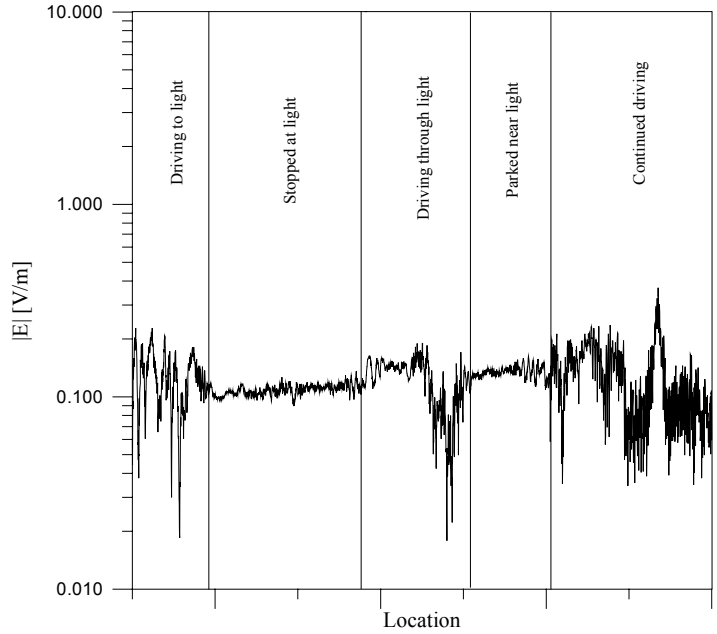

Figure 47. Measured E-field scaled to 1 MW EIRP at the intersection of Highway 93 and Highway 72. These results are for a transmitter on Eldorado Mountain for a frequency of 533 MHz, a transmitter height of 3.66 m (12.0 ft), and a receiver height of 2.95 m (9.68 ft).

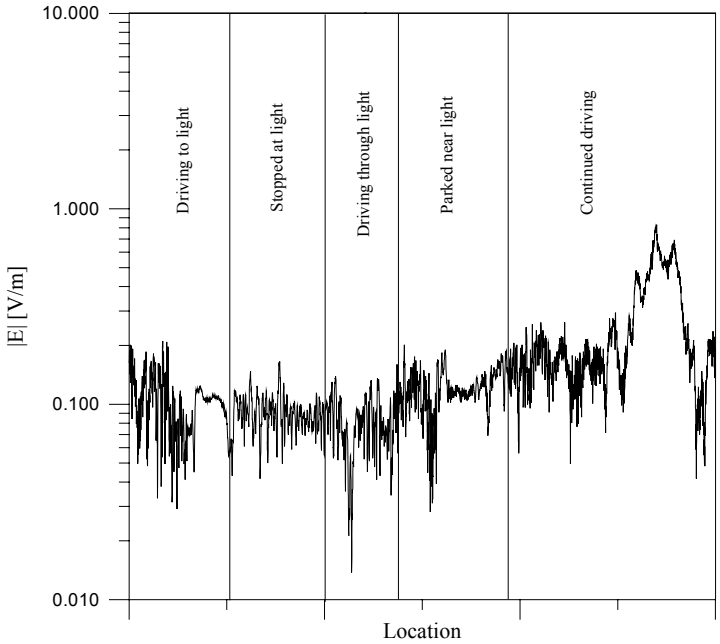

Figure 48. Measured E-field scaled to 1 MW EIRP at the intersection of Highway 93 and Highway 72. These results are for a transmitter on Eldorado Mountain for a frequency of 772 MHz, a transmitter height of 3.66 m (12.0 ft), and a receiver height of 2.95 m (9.68 ft).

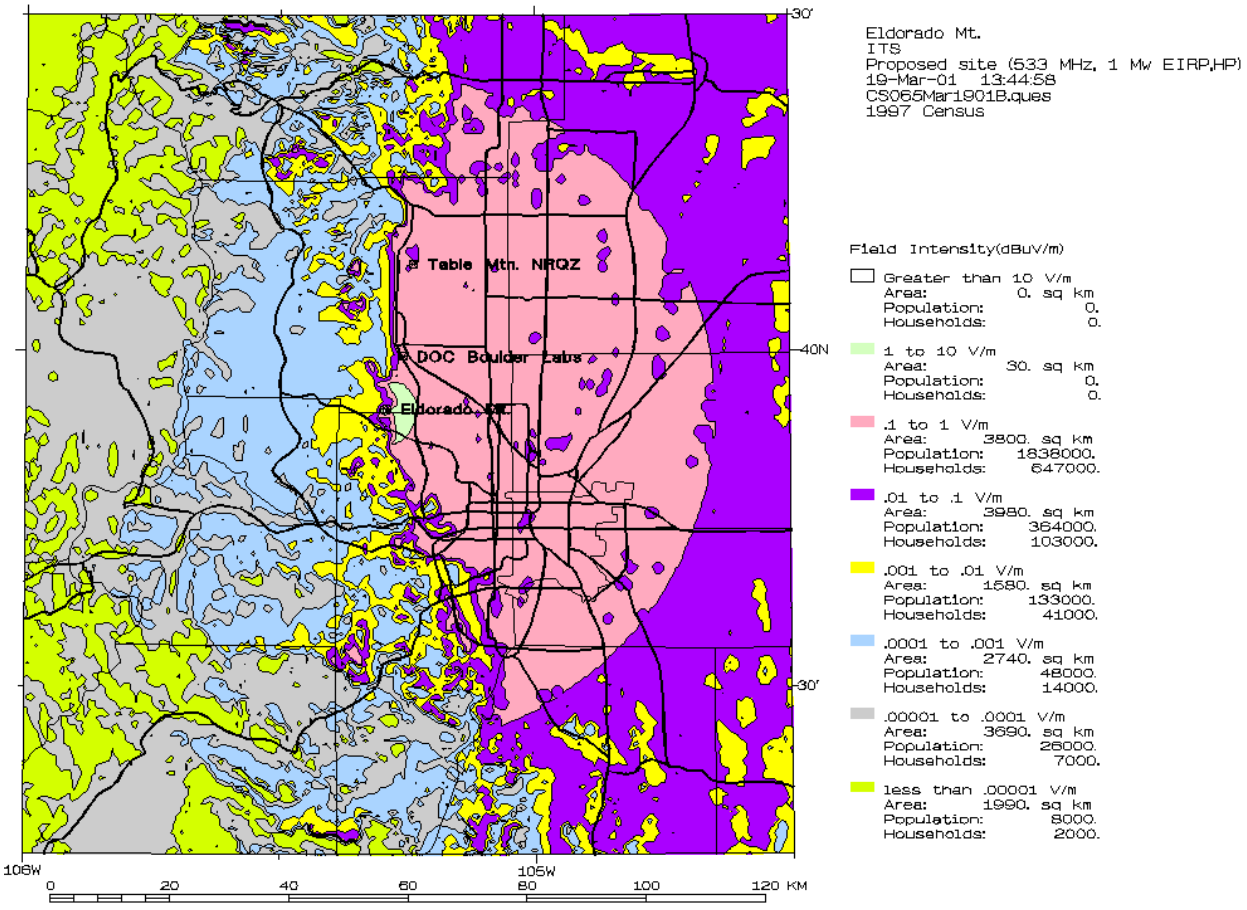

Figure 49. Contour plot of the modeled (or predicted) E-field levels around the Denver–Boulder area for a horizontally polarized antenna. These results are for a transmitter on Eldorado Mountain for a frequency of 533 MHz, EIRP=1 MW, a transmitter height of 3.66 m (12 ft), and a receiver height of 2.95 m (9.68 ft).

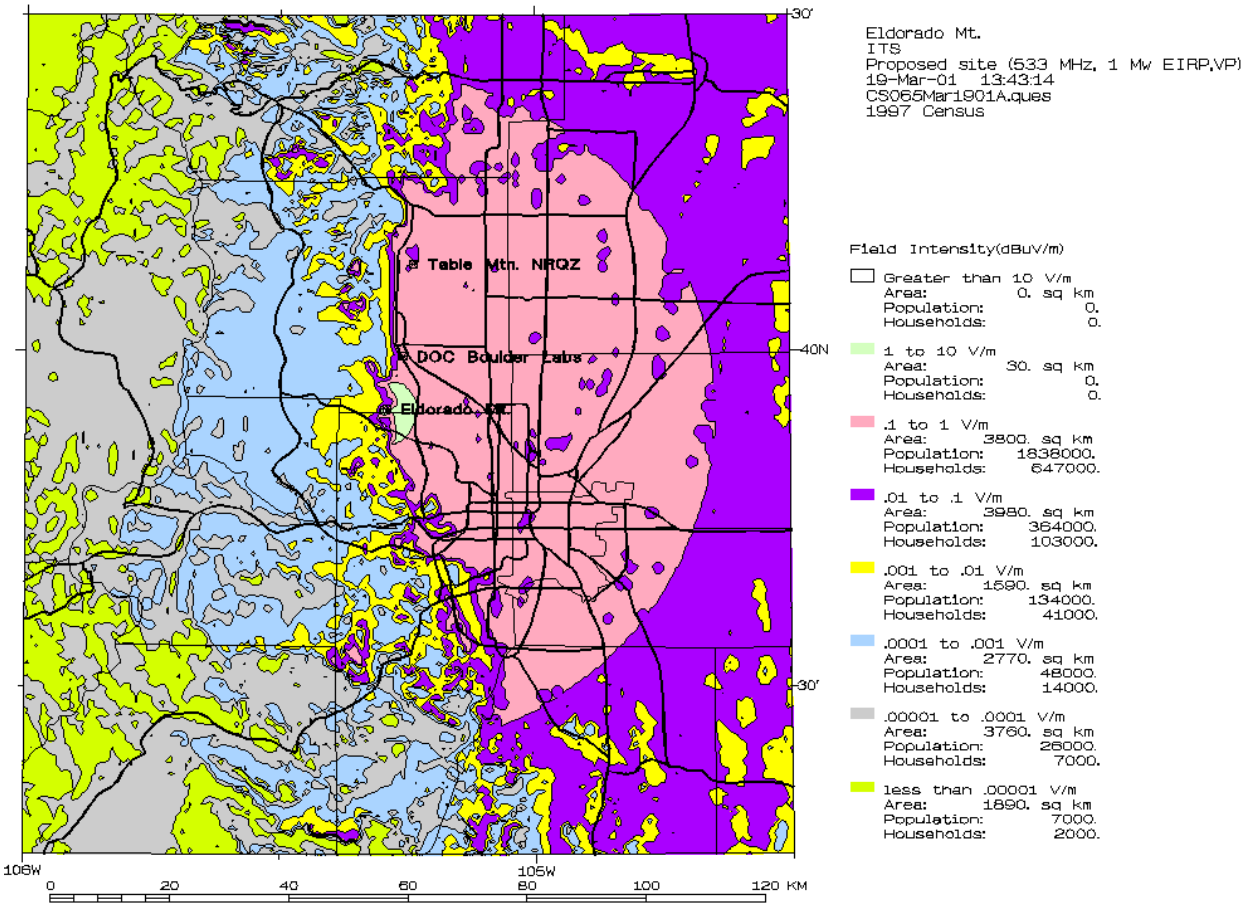

Figure 50. Contour plot of the modeled (or predicted) E-field levels around the Denver–Boulder area for a vertically polarized antenna. These results are for a transmitter on Eldorado Mountain for a frequency of 533 MHz, EIRP=1 MW, a transmitter height of 3.66 m (12 ft), and a receiver height of 2.95 m (9.68 ft).

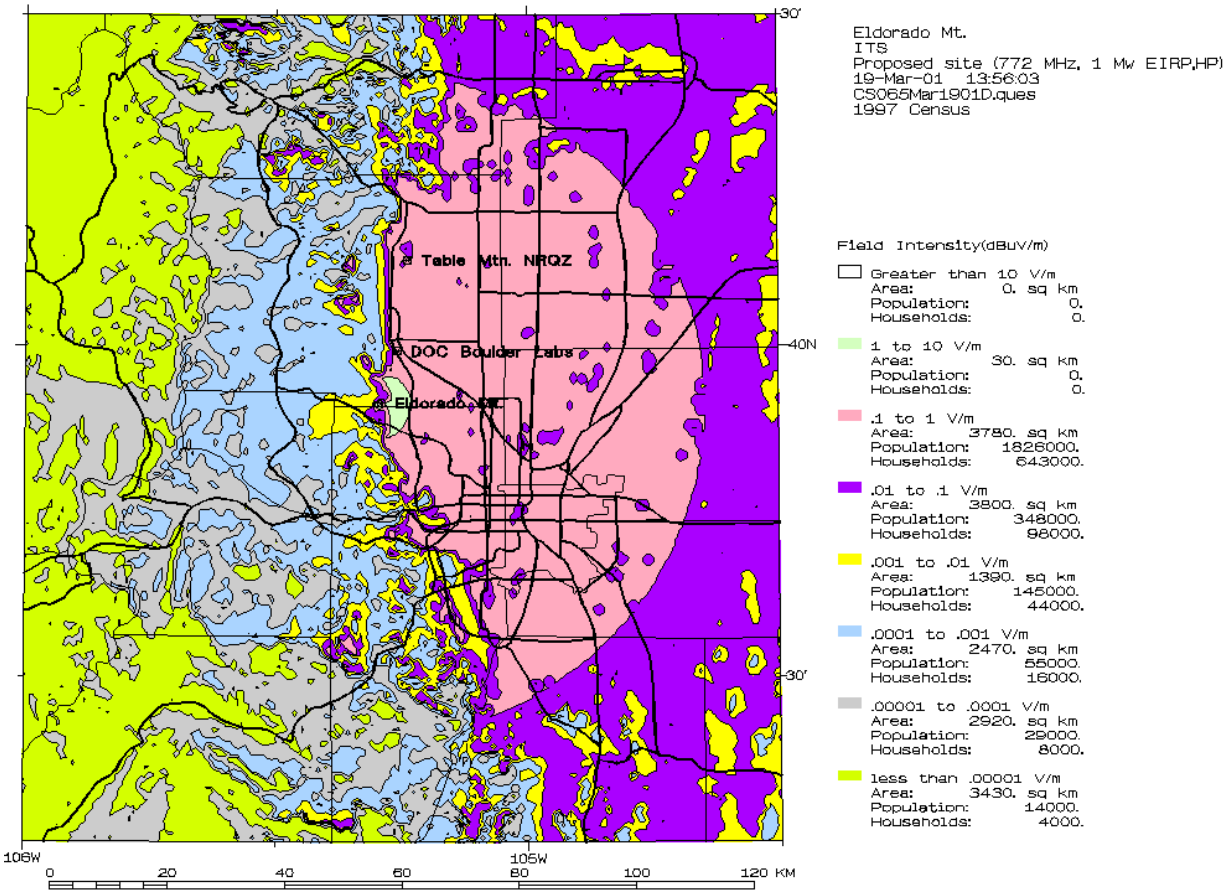

Figure 51. Contour plot of the modeled (or predicted) E-field levels around the Denver–Boulder area for a horizontally polarized antenna. These results are for a transmitter on Eldorado Mountain for a frequency of 772 MHz, EIRP=1 MW, a transmitter height of 3.66 m (12 ft), and a receiver height of 2.95 m (9.68 ft).

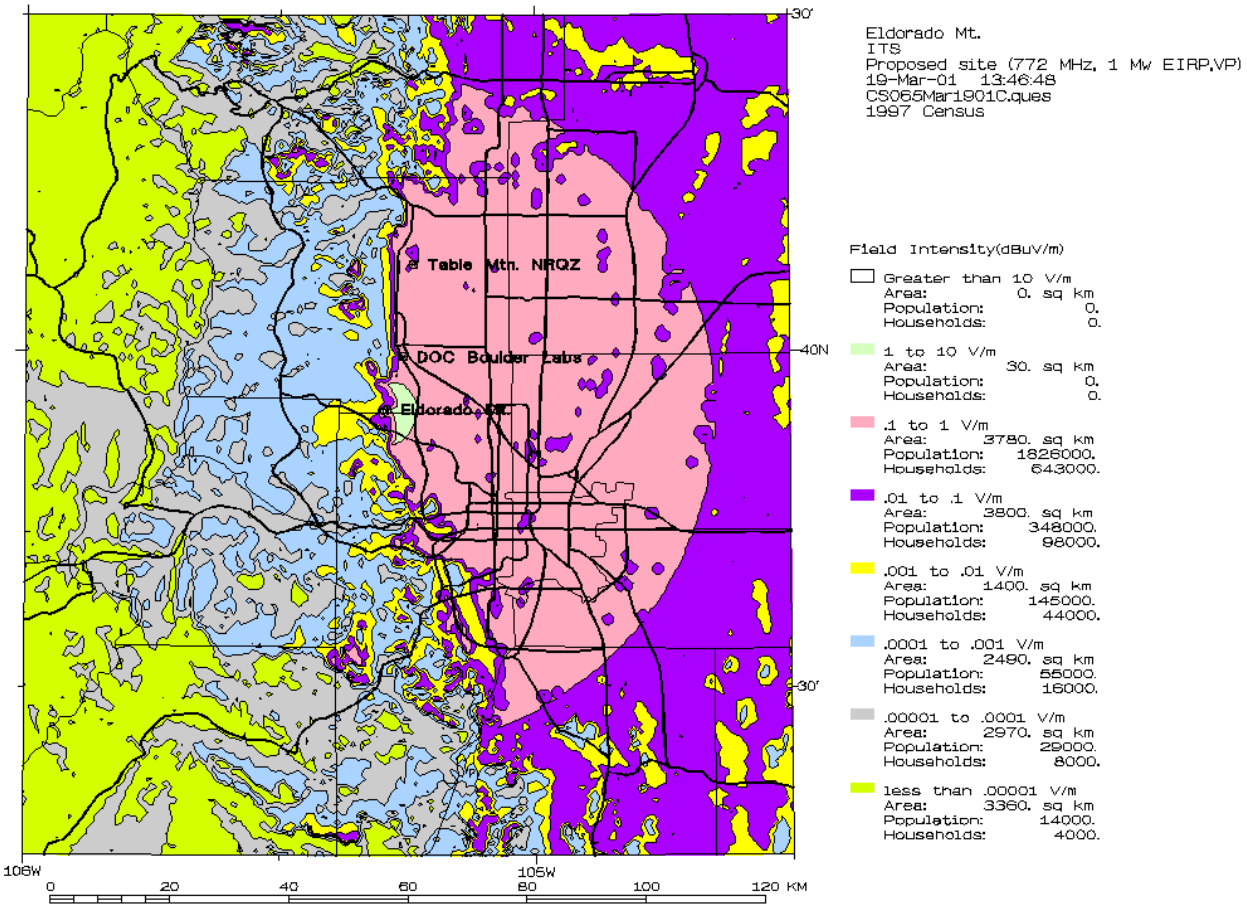

Figure 52. Contour plot of the modeled (or predicted) E-field levels around the Denver–Boulder area for a vertically polarized antenna. These results are for a transmitter on Eldorado Mountain for a frequency of 772 MHz, EIRP=1 MW, a transmitter height of 3.66 m (12 ft), and a receiver height of 2.95 m (9.68 ft).

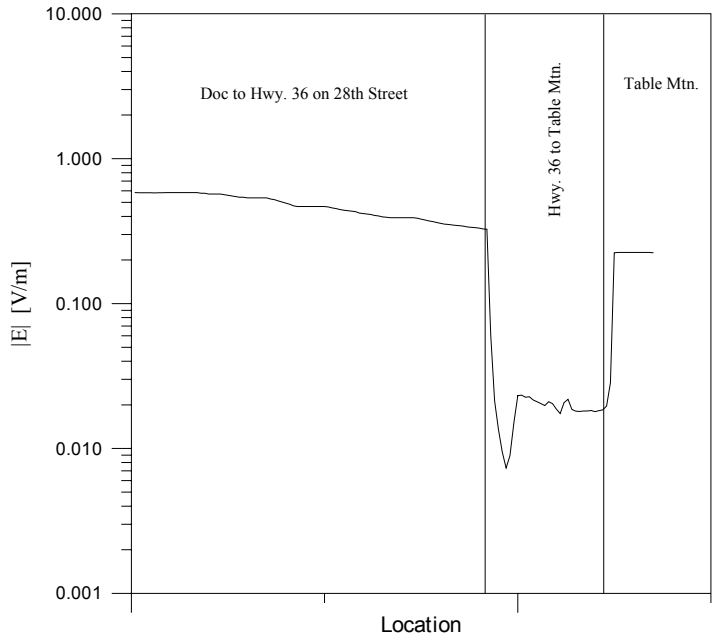

Figure 53. Modeled (or predicted) E-field levels on the 28th Street Route. These results are for a transmitter on Eldorado Mountain for a frequency of 533 MHz, EIRP=1 MW, a transmitter height of 3.66 m (12 ft), and a receiver height of 2.95 m (9.68 ft).

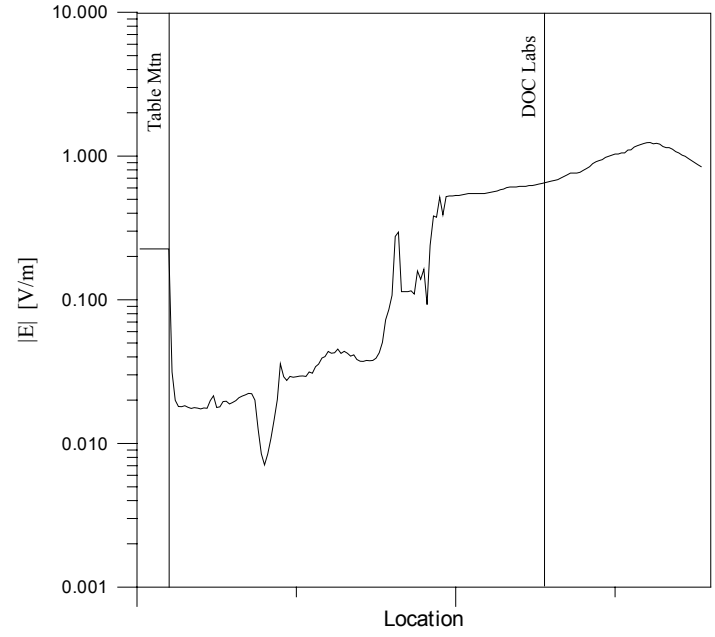

Figure 54. Modeled (or predicted) E-field levels on the Broadway Route. These results are for a transmitter on Eldorado Mountain for a frequency of 533 MHz, EIRP=1 MW, a transmitter height of 3.66 m (12 ft), and a receiver height of 2.95 m (9.68 ft).

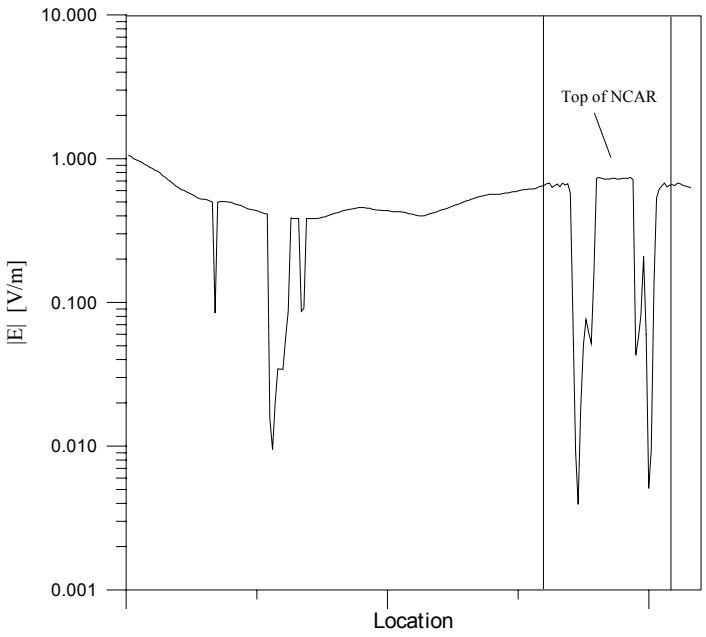

Figure 55. Modeled (or predicted) E-field levels on the McCaslin Loop. These results are for a transmitter on Eldorado Mountain for a frequency of 533 MHz, EIRP=1 MW, a transmitter height of 3.66 m (12 ft), and a receiver height of 2.95 m (9.68 ft).

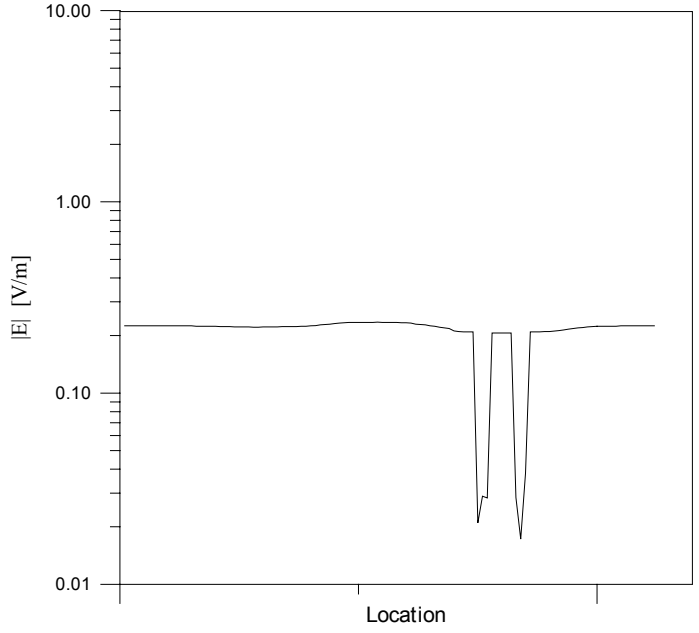

Figure 56. Modeled (or predicted) E-field levels at the Table Mountain NRQZ. These results are for a transmitter on Eldorado Mountain for a frequency of 533 MHz, EIRP=1 MW, a transmitter height of 3.66 m (12 ft), and a receiver height of 2.95 m (9.68 ft).

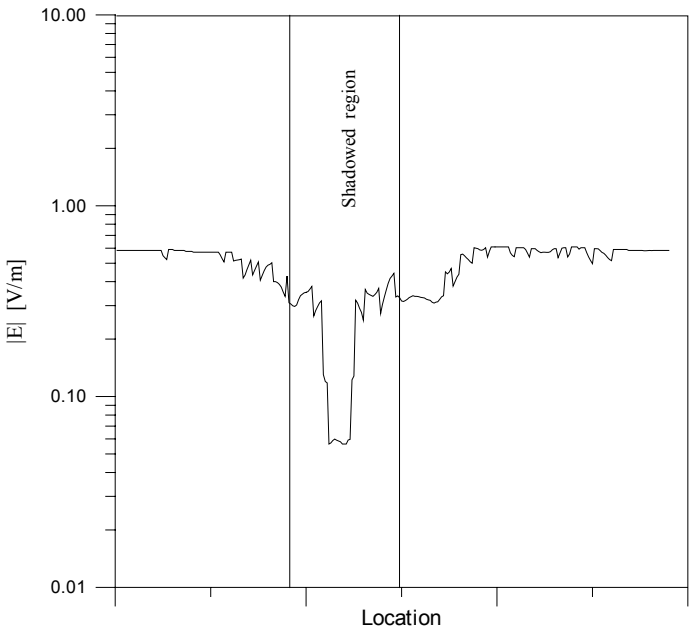

Figure 57. Modeled (or predicted) E-field levels at the DOC Laboratories. These results are for a transmitter on Eldorado Mountain for a frequency of 533 MHz, EIRP=1 MW, a transmitter height of 3.66 m (12 ft), and a receiver height of 2.95 m (9.68 ft).

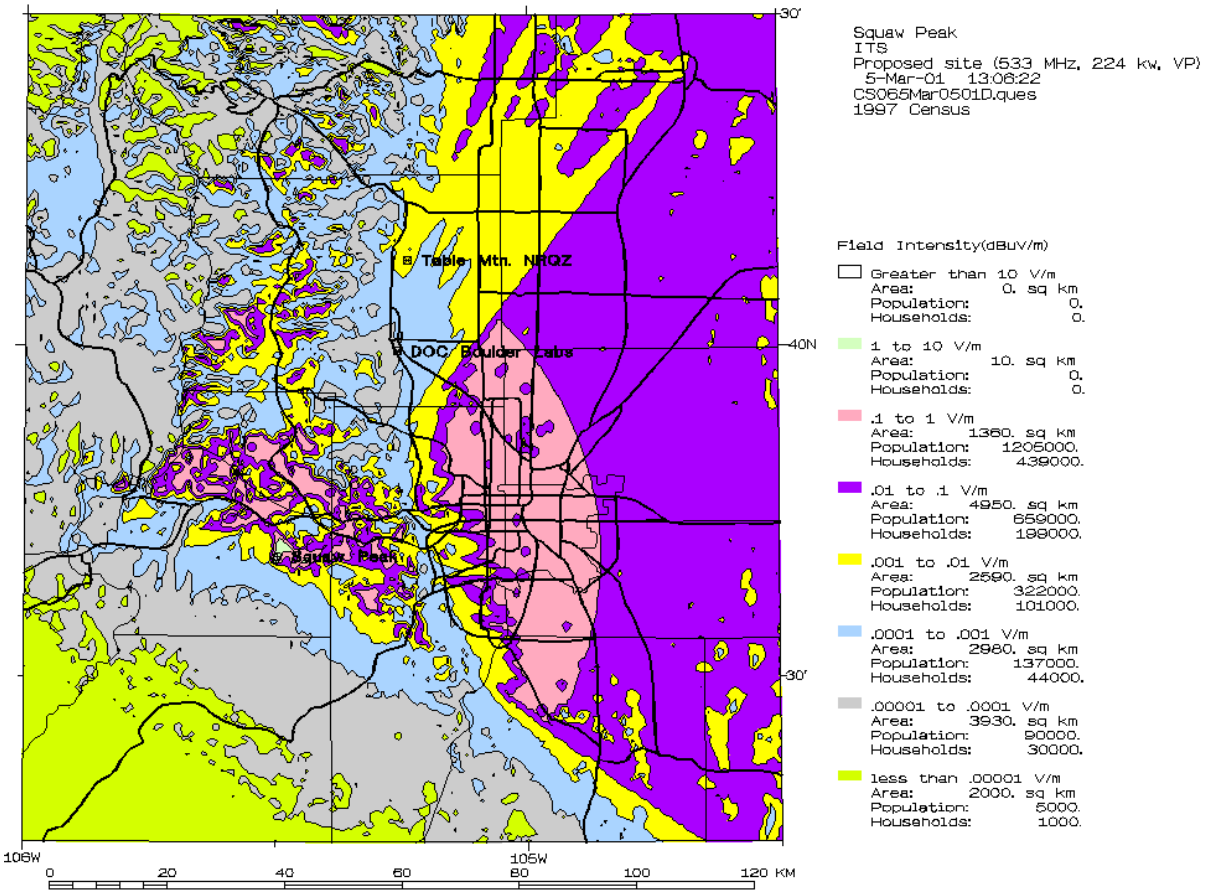

Figure 58. Contour plot of the modeled (or predicted) E-field levels around the Denver–Boulder area for a horizontally polarized antenna. These results are for a transmitter on Squaw Mountain for a frequency of 533 MHz, EIRP=1 MW, a transmitter height of 8.20 m (26.91 ft), and a receiver height of 2.95 m (9.68 ft).

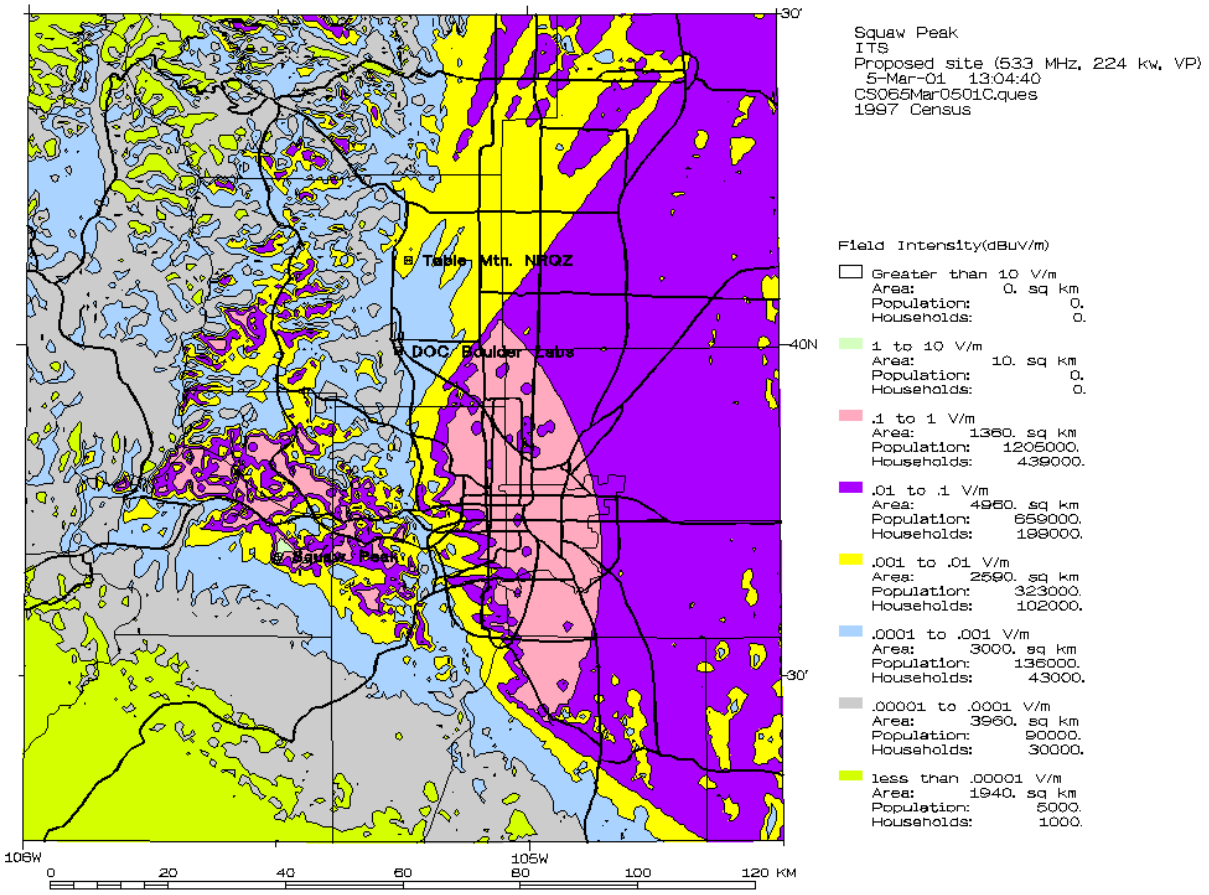

Figure 59. Contour plot of the modeled (or predicted) E-field levels around the Denver–Boulder area for a vertically polarized antenna. These results are for a transmitter on Squaw Mountain for a frequency of 533 MHz, EIRP=1 MW, a transmitter height of 8.20 m (26.91 ft), and a receiver height of 2.95 m (9.68 ft).

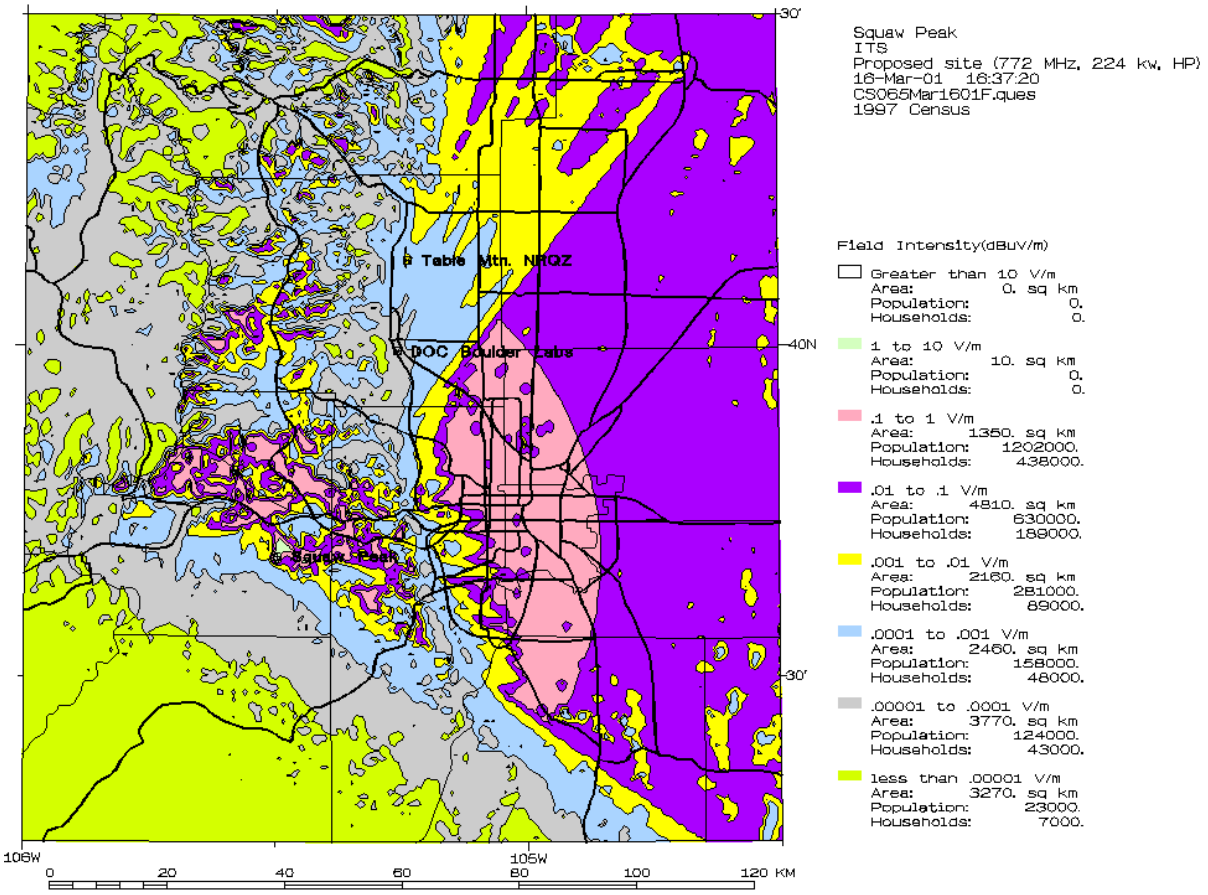

Figure 60. Contour plot of the modeled (or predicted) E-field levels around the Denver–Boulder area for a horizontally polarized antenna. These results are for a transmitter on Squaw Mountain for a frequency of 772 MHz, EIRP=1 MW, a transmitter height of 8.20 m (26.91 ft), and a receiver height of 2.95 m (9.68 ft).

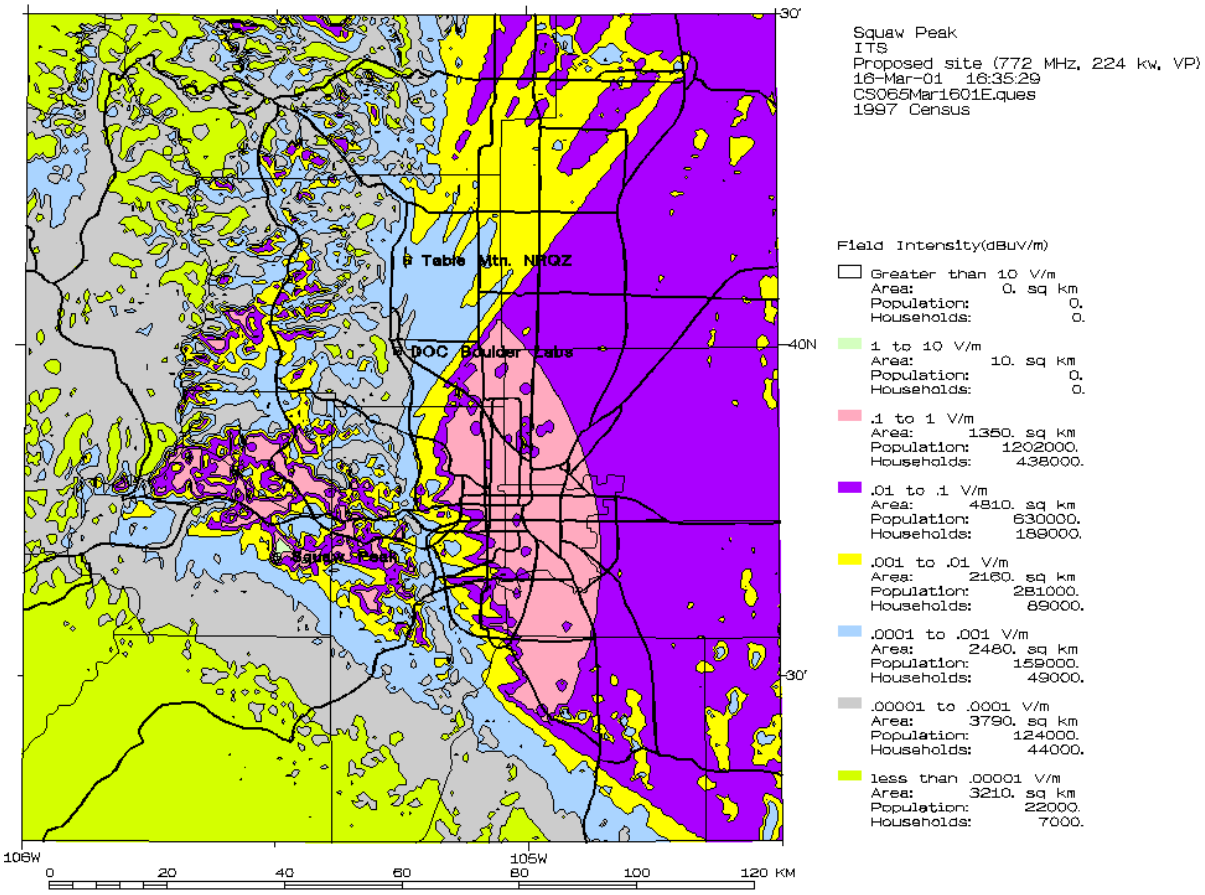

Figure 61. Contour plot of the modeled (or predicted) E-field levels around the Denver–Boulder area for a vertically polarized antenna. These results are for a transmitter on Squaw Mountain for a frequency of 772 MHz, EIRP=1 MW, a transmitter height of 8.20 m (26.91 ft), and a receiver height of 2.95 m (9.68 ft).

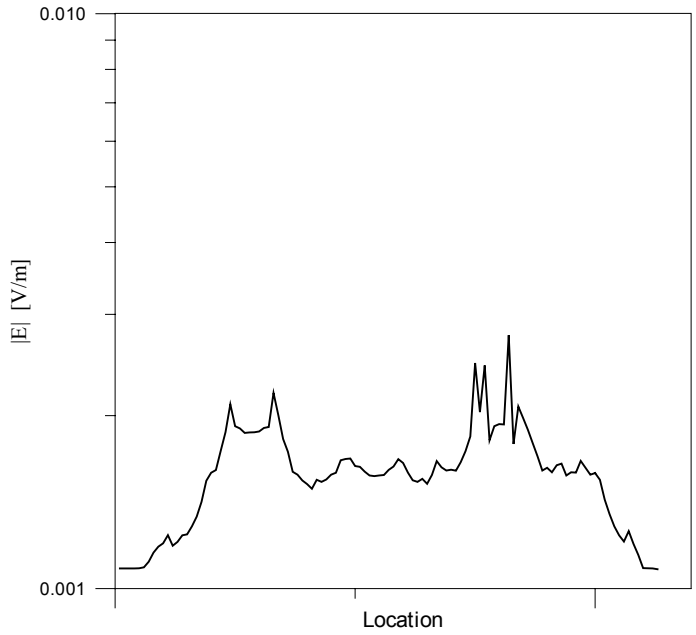

Figure 62. Modeled (or predicted) E-field levels at the Table Mountain NRQZ. These results are for a transmitter on Squaw Mountain for a frequency of 533 MHz, EIRP=1 MW, a transmitter height of 8.20 m (26.91 ft), and a receiver height of 2.95 m (9.68 ft).

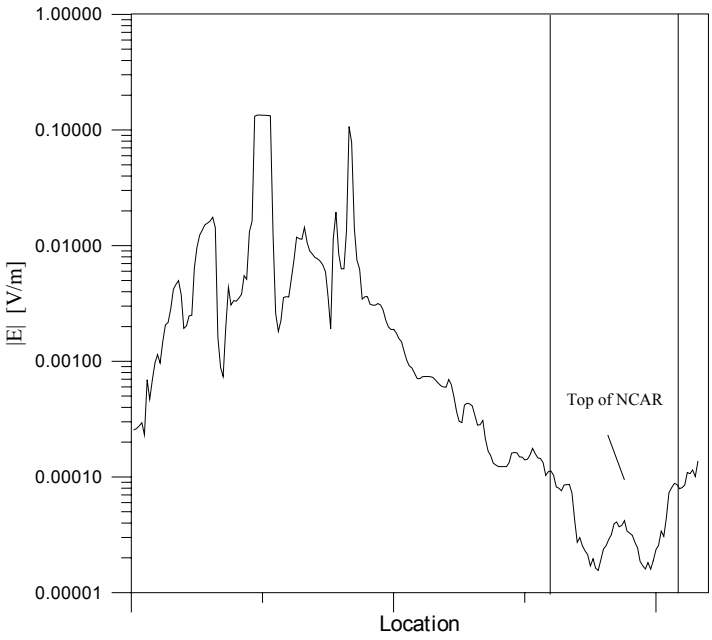

Figure 63. Modeled (or predicted) E-field levels on the McCaslin Loop. These results are for a transmitter on Squaw Mountain for a frequency of 533 MHz, EIRP=1 MW, a transmitter height of 8.20 m (26.91 ft), and a receiver height of 2.95 m (9.68 ft).

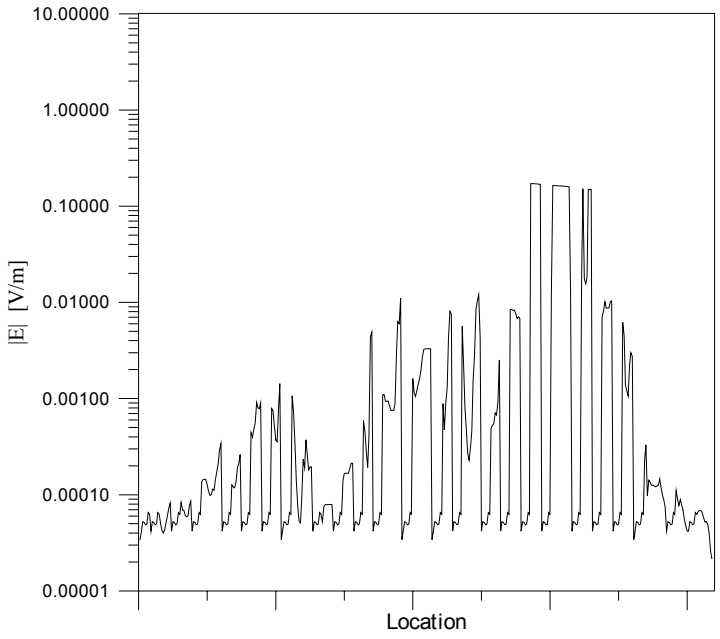

Figure 64. Modeled (or predicted) E-field levels on the Golden/Boulder Route. These results are for a transmitter on Squaw Mountain for a frequency of 533 MHz, EIRP=1 MW, a transmitter height of 8.20 m (26.91 ft), and a receiver height of 2.95 m (9.68 ft).

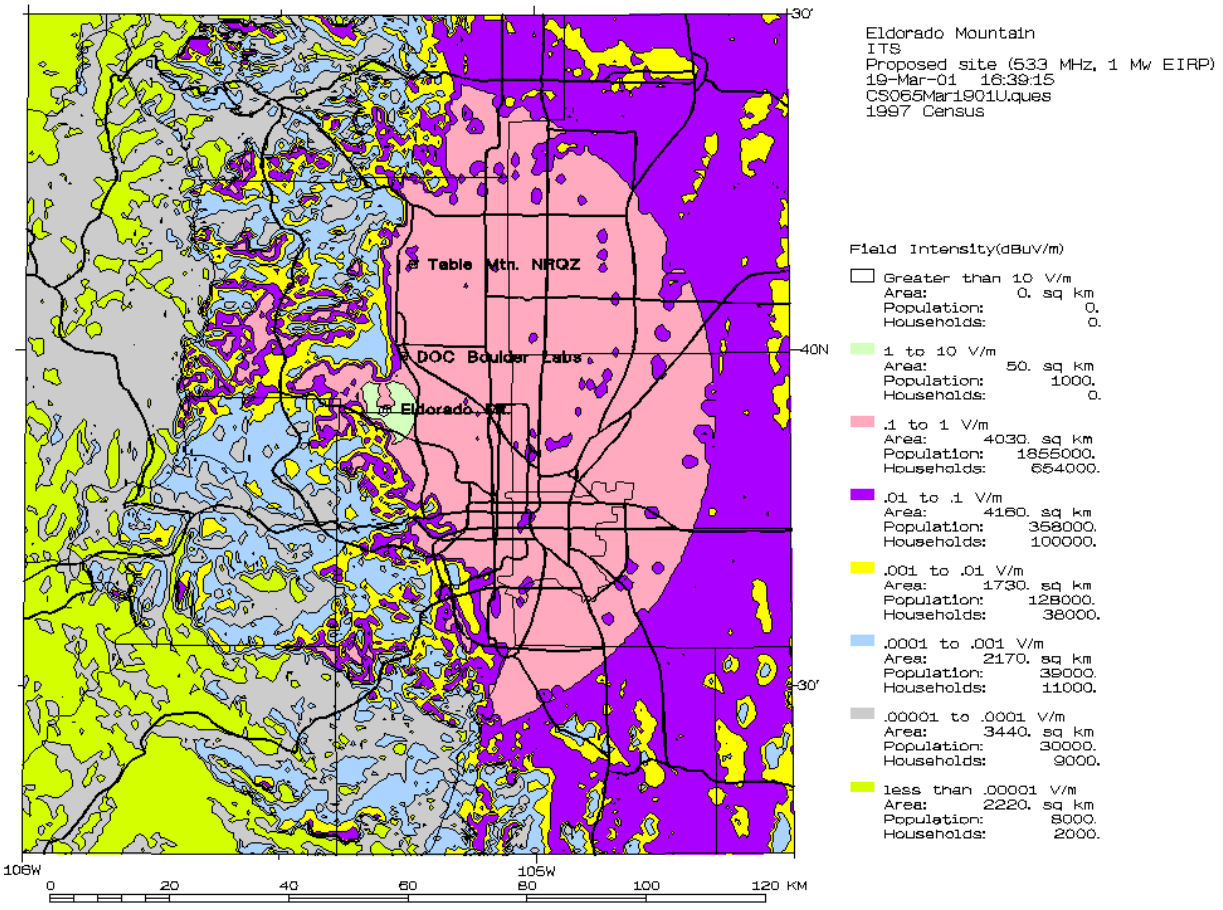

Figure 65. Contour plot of the modeled (or predicted) E-field levels around the Denver–Boulder area for a horizontally polarized antenna. These results are for a transmitter on Eldorado Mountain for a frequency of 533 MHz, EIRP=1 MW, a transmitter height of 116 m (379 ft), and a receiver height of 2 m (6.56 ft).

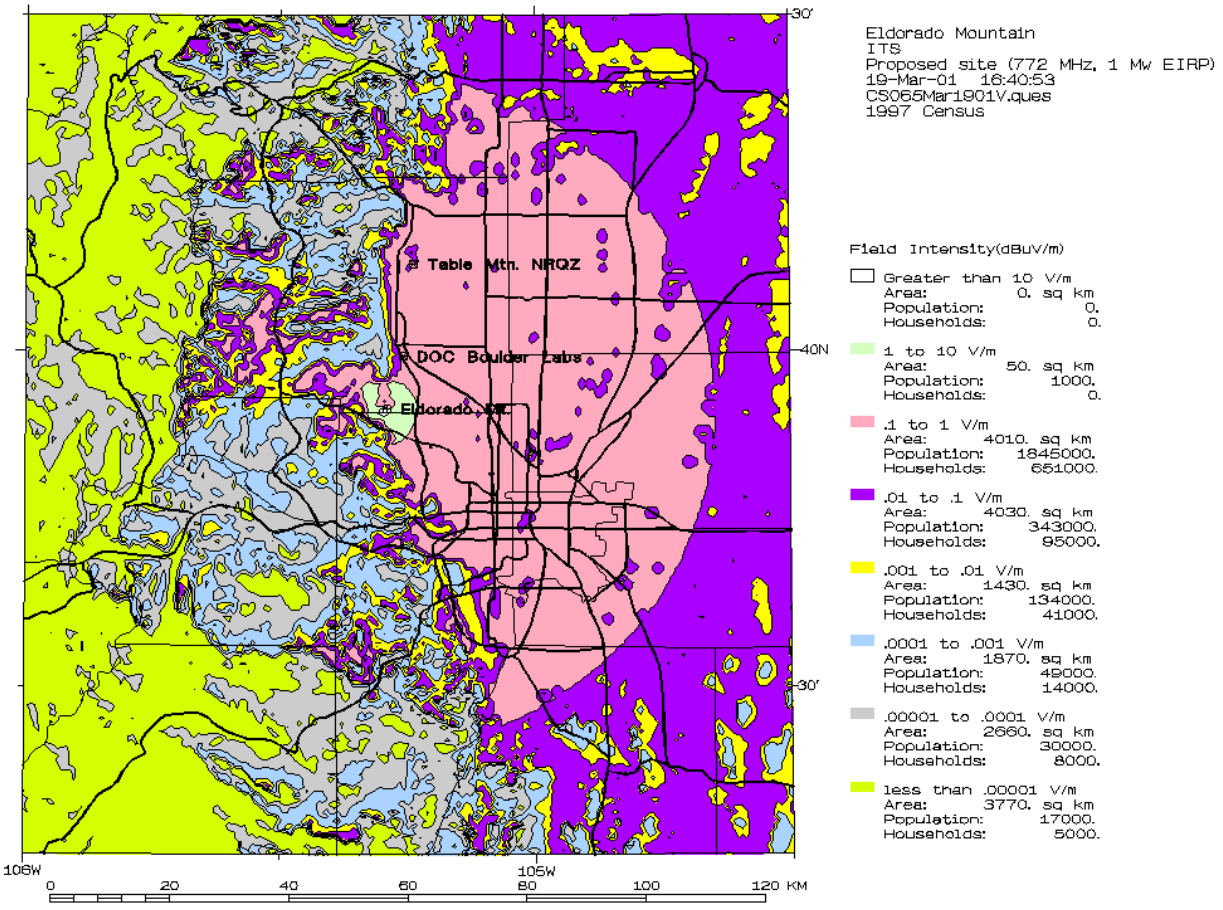

Figure 66. Contour plot of the modeled (or predicted) E-field levels around the Denver–Boulder area for a horizontally polarized antenna. These results are for a transmitter on Eldorado Mountain for a frequency of 772 MHz, EIRP=1 MW, a transmitter height of 116 m (379 ft), and a receiver height of 2 m (6.56 ft).

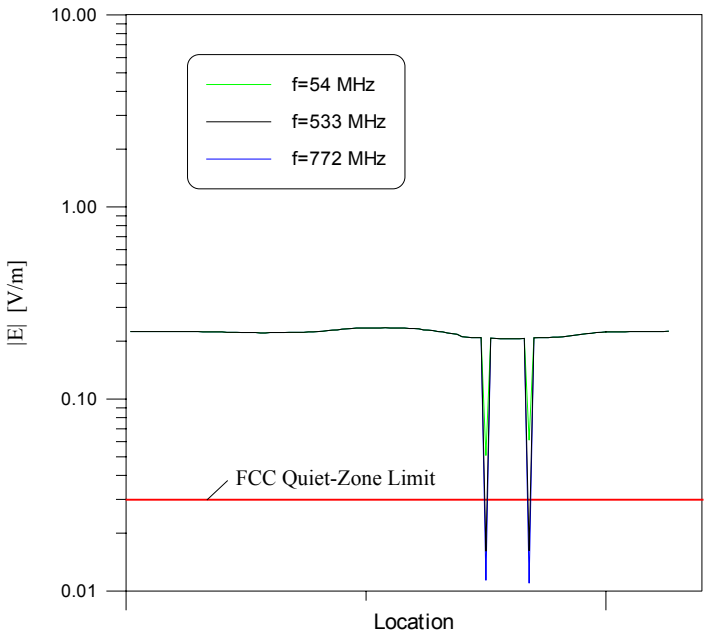

Figure 67. Modeled (or predicted) E-field levels at the Table Mountain NRQZ. These results are for a transmitter on Eldorado Mountain, EIRP=1 MW, a transmitter height of 116 m (397 ft), and a receiver height of 2 m (6.56 ft).

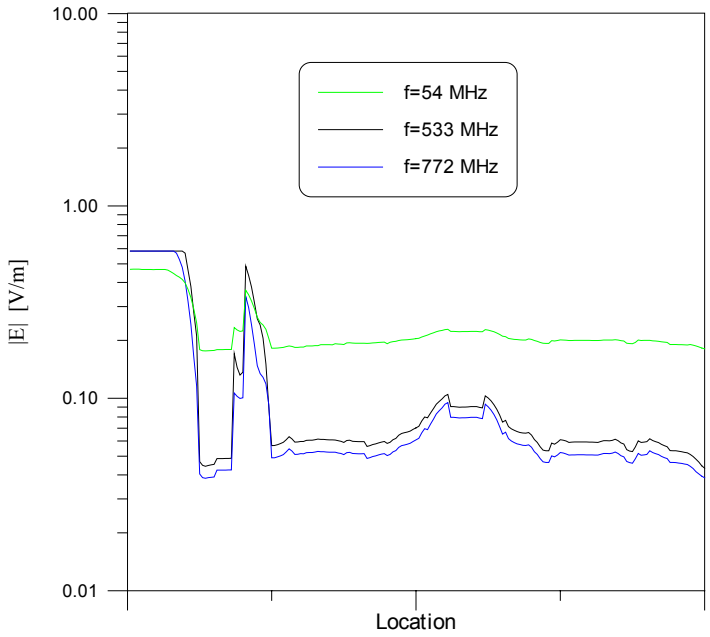

Figure 68. Modeled (or predicted) E-field levels at the DOC Laboratories. These results are for a transmitter on Eldorado Mountain, EIRP=1 MW, a transmitter height of 116 m (397 ft), and a receiver height of 2 m (6.56 ft).

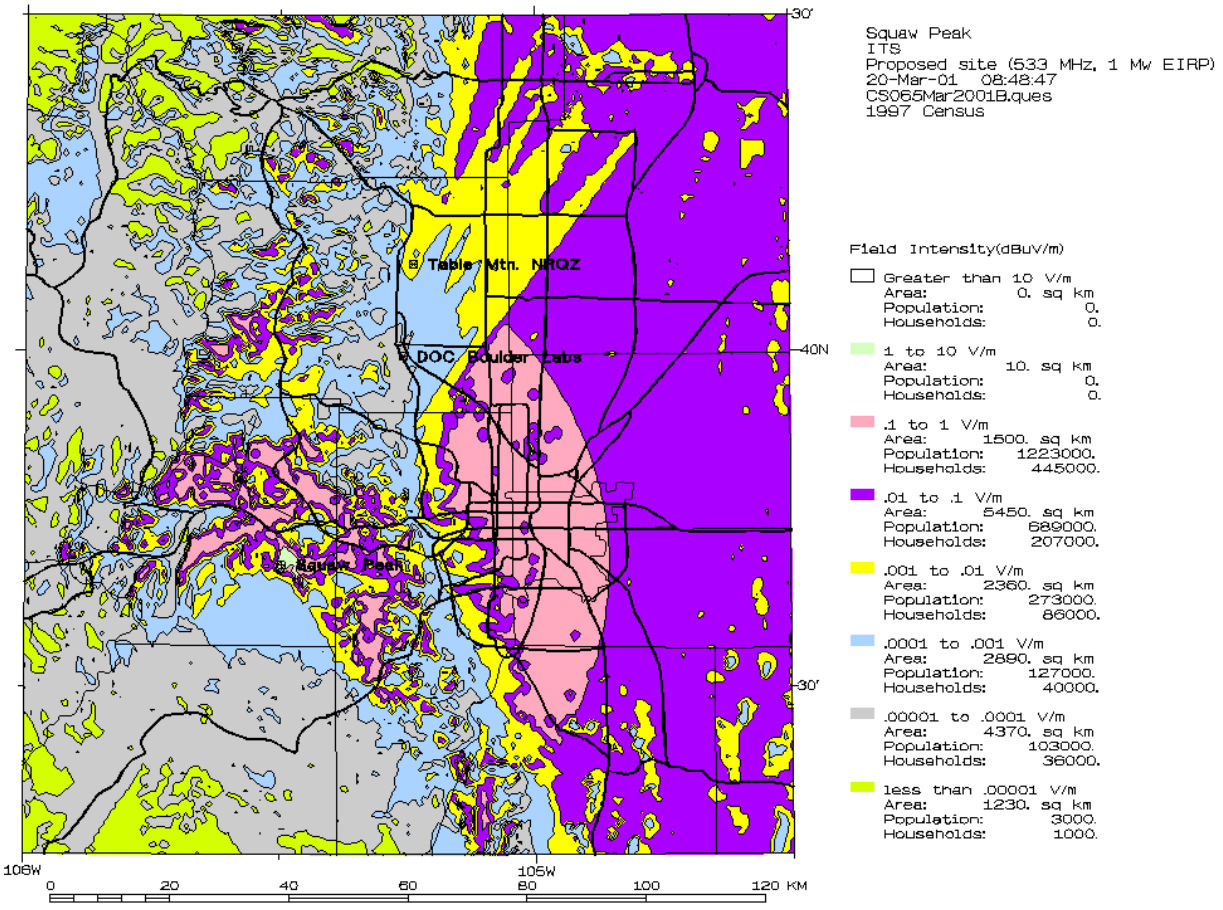

Figure 69. Contour plot of the modeled (or predicted) E-field levels around the Denver–Boulder area for a horizontally polarized antenna. These results are for a transmitter on Squaw Mountain for a frequency of 533 MHz, EIRP=1 MW, a transmitter height of 60.96 m (200 ft), and a receiver height of 2 m (6.56 ft).

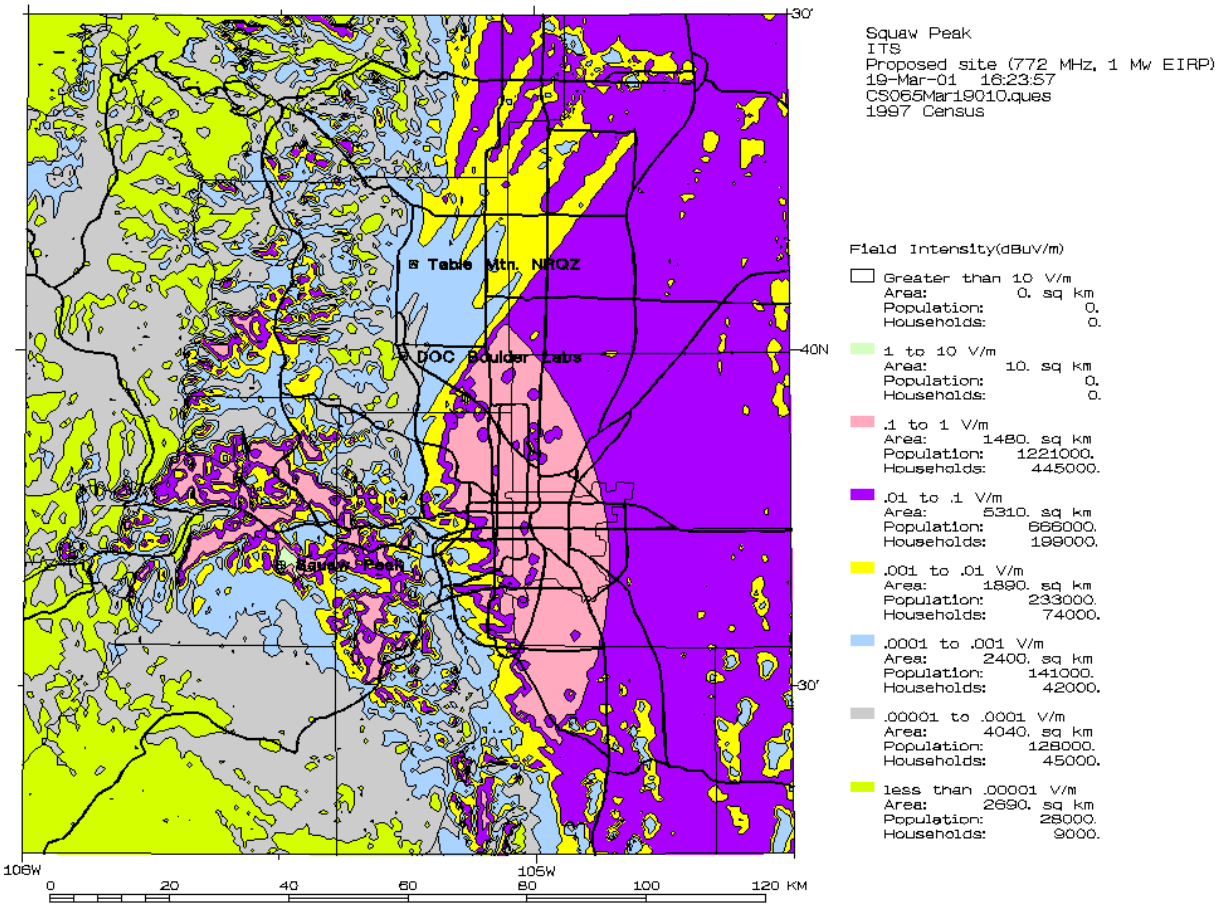

Figure 70. Contour plot of the modeled (or predicted) E-field levels around the Denver–Boulder area for a horizontally polarized antenna. These results are for a transmitter on Squaw Mountain for a frequency of 772 MHz, EIRP=1 MW, a transmitter height of 60.96 m (200 ft), and a receiver height of 2 m (6.56 ft).

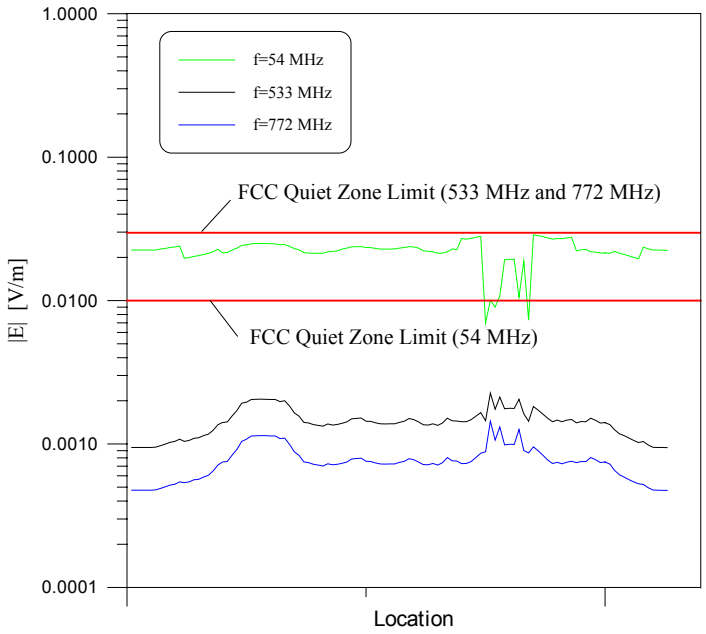

Figure 71. Modeled (or predicted) E-field levels at the Table Mountain NRQZ. These results are for a transmitter on Squaw Mountain, EIRP=1 MW, a transmitter height of 60.96 m (200 ft), and a receiver height of 2 m (6.56 ft).

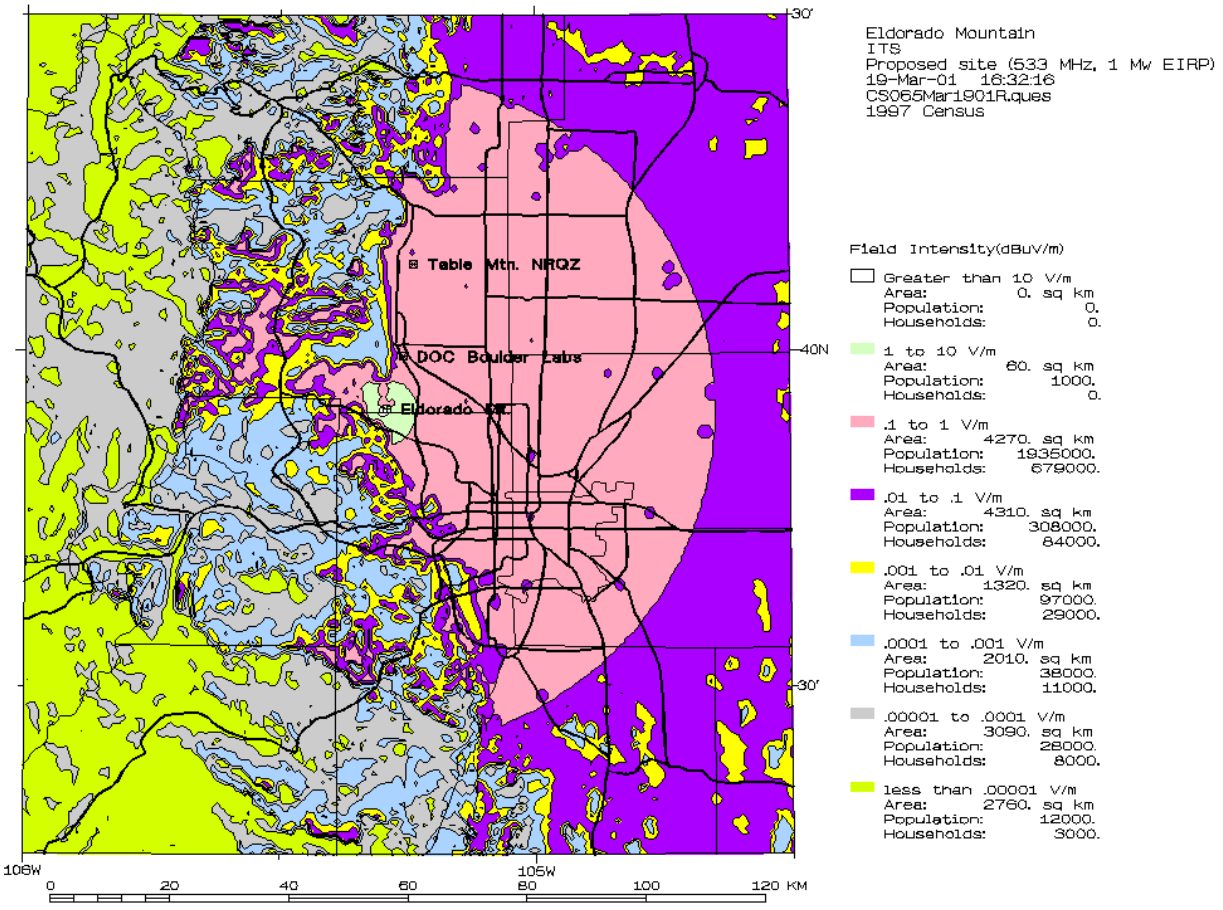

Figure 72. Contour plot of the modeled (or predicted) E-field levels around the Denver–Boulder area for a horizontally polarized antenna. These results are for a transmitter on Eldorado Mountain for a frequency of 533 MHz, EIRP=1 MW, a transmitter height of 116 m (379 ft), and a receiver height of 9.14 m (30 ft).

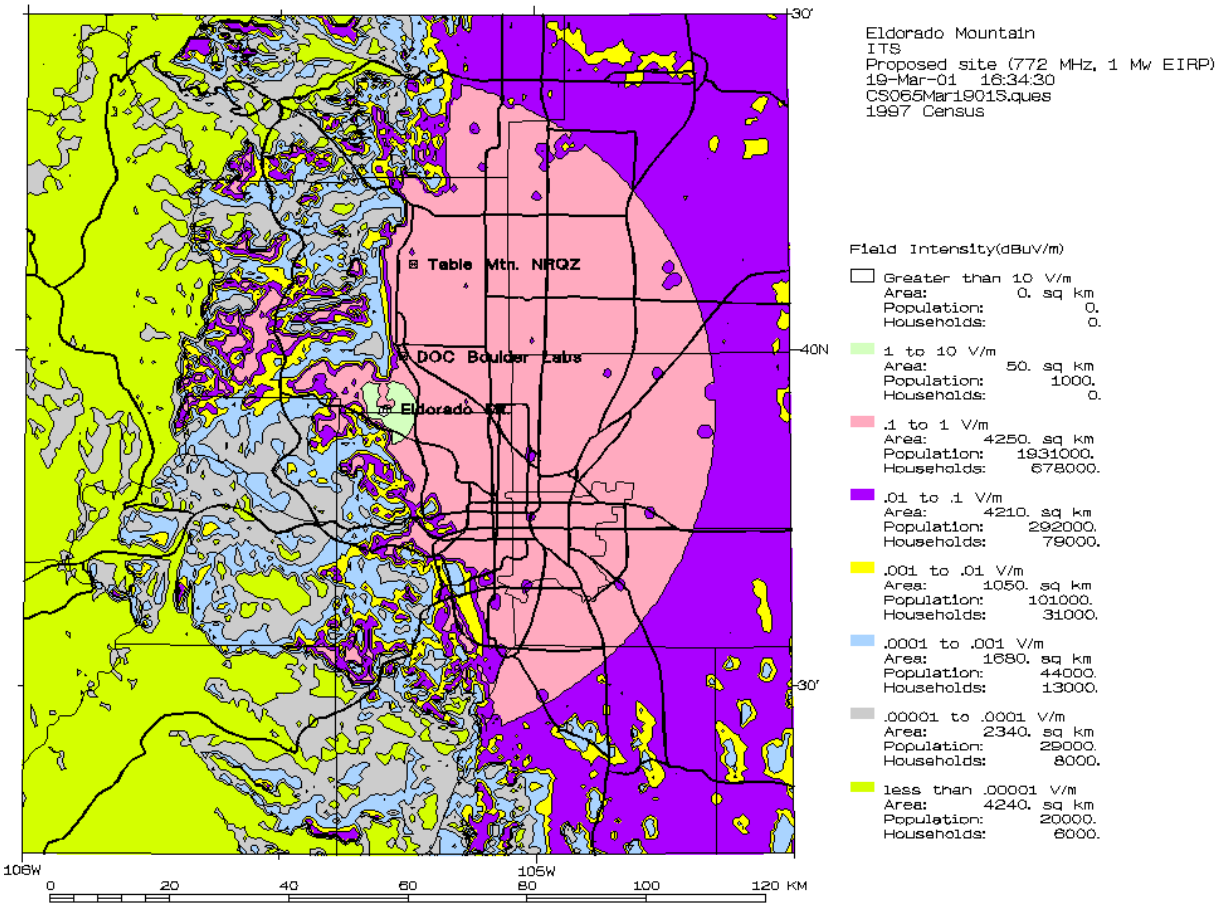

Figure 73. Contour plot of the modeled (or predicted) E-field levels around the Denver–Boulder area for a horizontally polarized antenna. These results are for a transmitter on Eldorado Mountain for a frequency of 772 MHz, EIRP=1 MW, a transmitter height of 116 m (379 ft), and a receiver height of 9.14 m (30 ft).

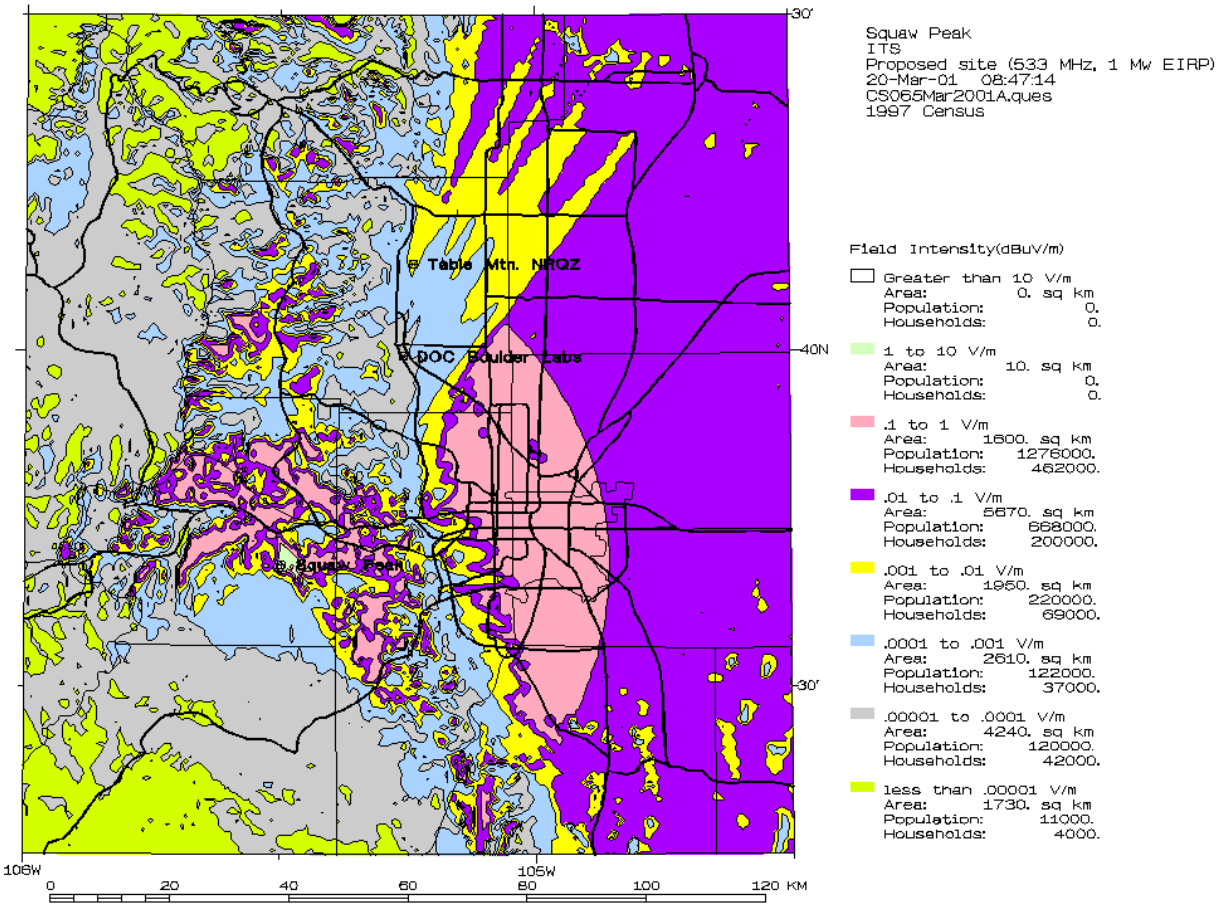

Figure 74. Contour plot of the modeled (or predicted) E-field levels around the Denver–Boulder area for a horizontally polarized antenna. These results are for a transmitter on Squaw Mountain for a frequency of 533 MHz, EIRP=1 MW, a transmitter height of 60.96 m (200 ft), and a receiver height of 9.14 m (30 ft).

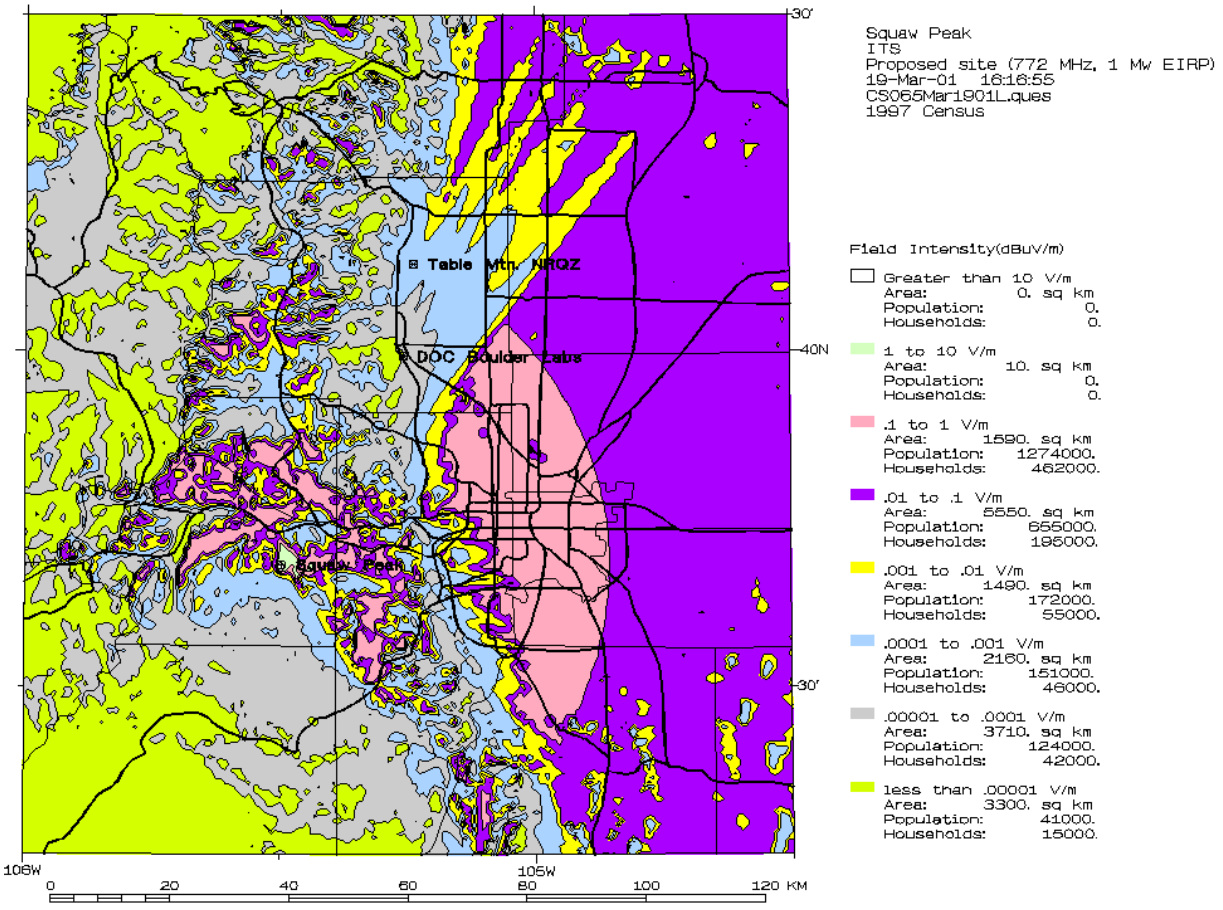

Figure 75. Contour plot of the modeled (or predicted) E-field levels around the Denver–Boulder area for a horizontally polarized antenna. These results are for a transmitter on Squaw Mountain for a frequency of 772 MHz, EIRP=1 MW, a transmitter height of 60.96 m (200 ft), and a receiver height of 9.14 m (30 ft).

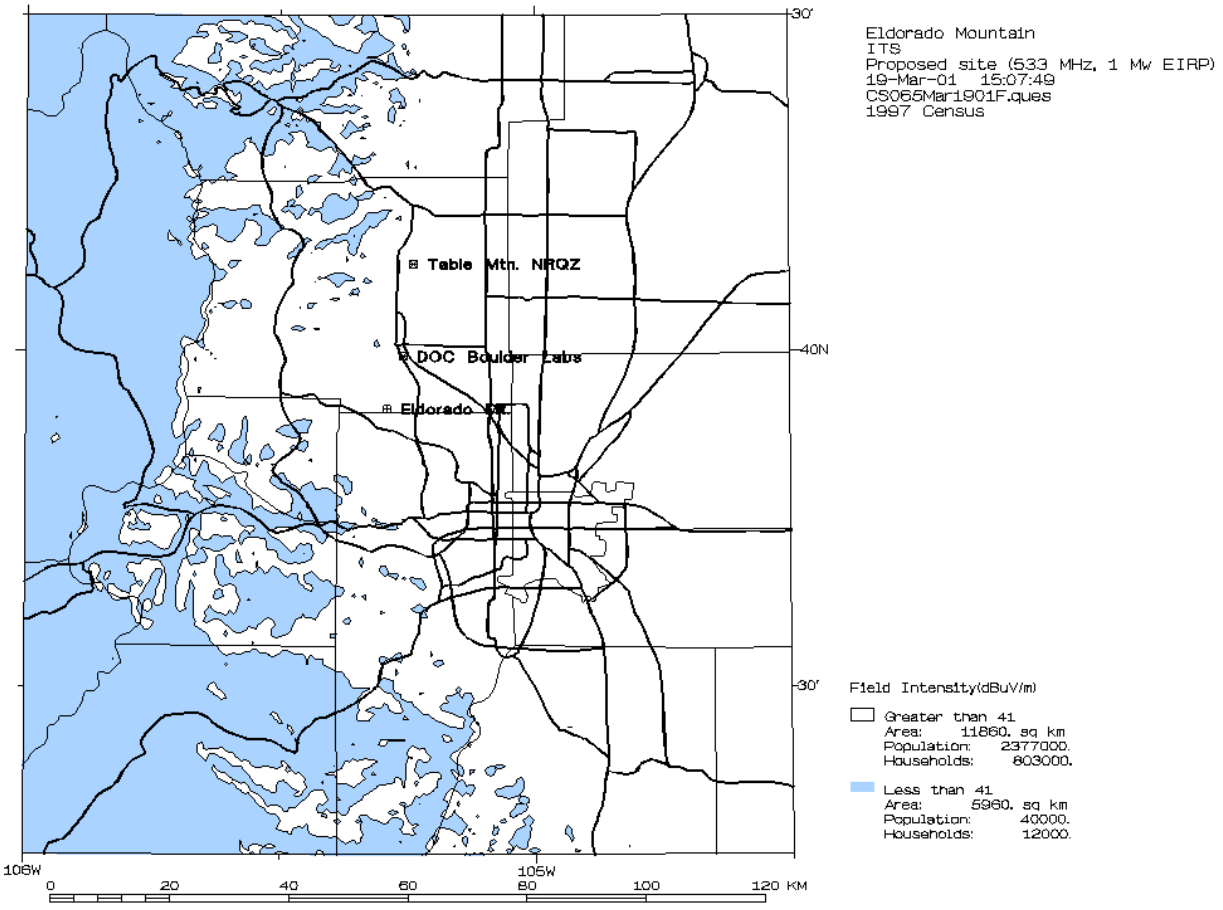

Figure 76. Area coverage plot of the 41 dBµV/m FCC recommendation around the Denver–Boulder area for a horizontally polarized antenna. These results are for a transmitter on Eldorado Mountain for a frequency of 533 MHz, EIRP=1 MW, a transmitter height of 116 m (379 ft), and a receiver height of 9.14 m (30 ft).

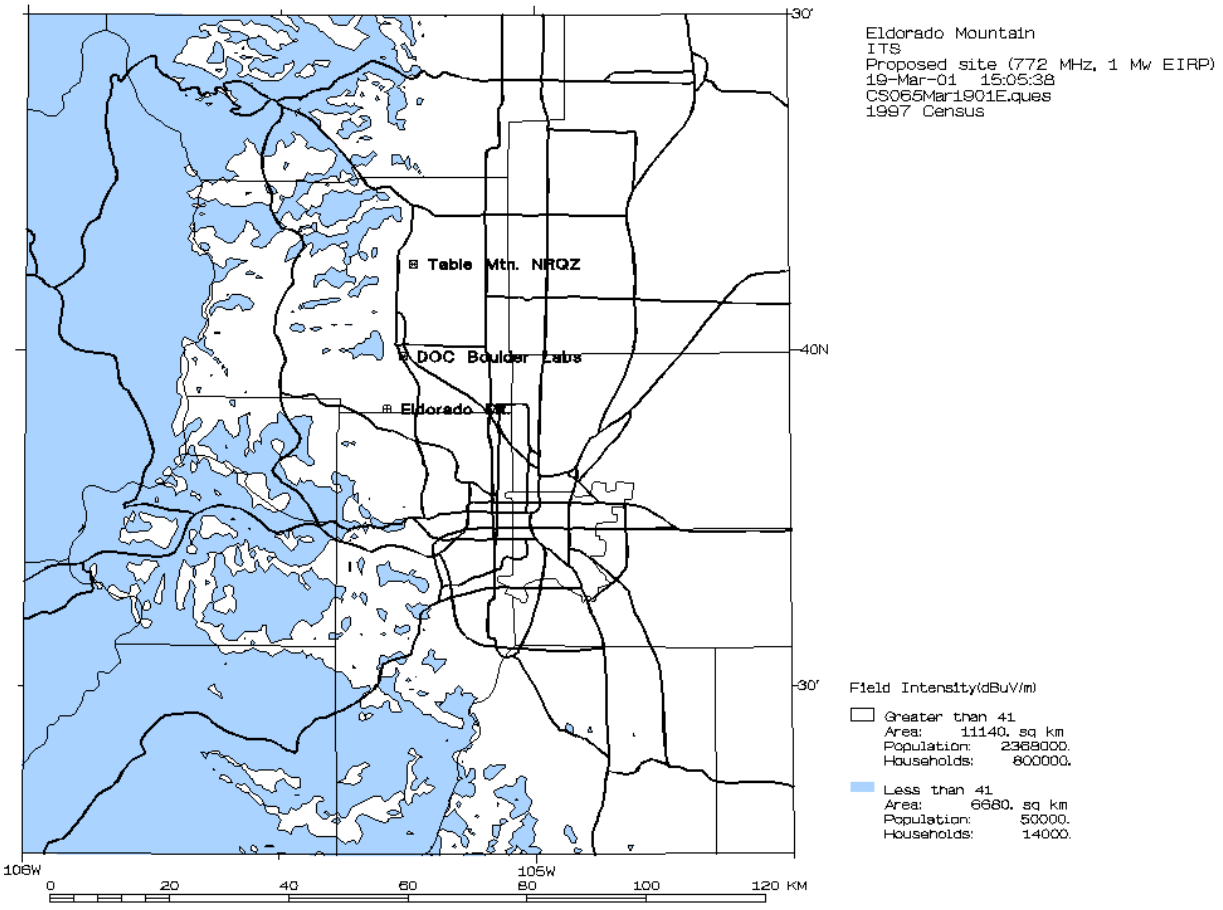

Figure 77. Area coverage plot of the 41 dBµV/m FCC recommendation around the Denver–Boulder area for a horizontally polarized antenna. These results are for a transmitter on Eldorado Mountain for a frequency of 772 MHz, EIRP=1 MW, a transmitter height of 116 m (379 ft), and a receiver height of 9.14 m (30 ft).

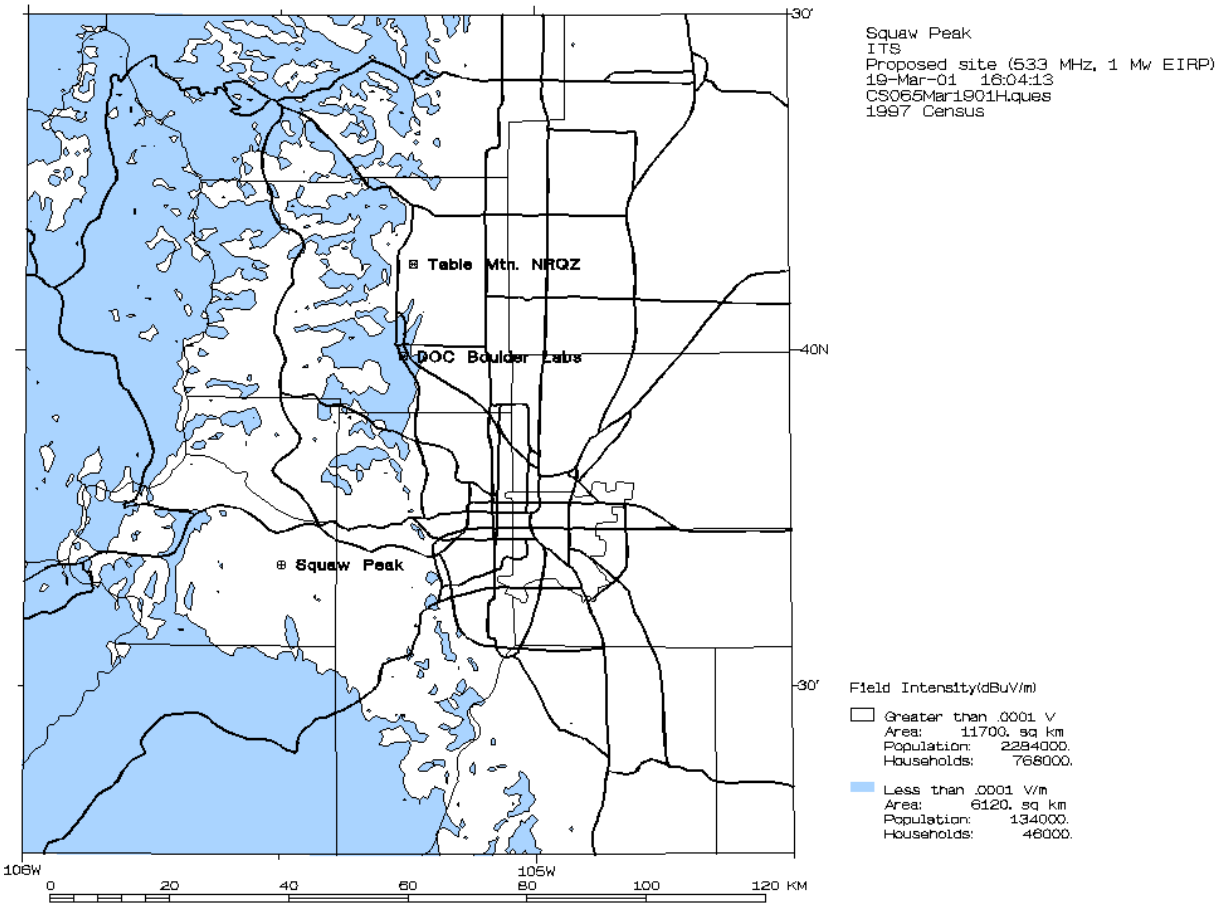

Figure 78. Area coverage plot of the 41 dBμV/m FCC recommendation around the Denver–Boulder area for a horizontally polarized antenna. These results are for a transmitter on Squaw Mountain for a frequency of 533 MHz, EIRP=1 MW, a transmitter height of 60.96 m (200 ft), and a receiver height of 9.14 m (30 ft).

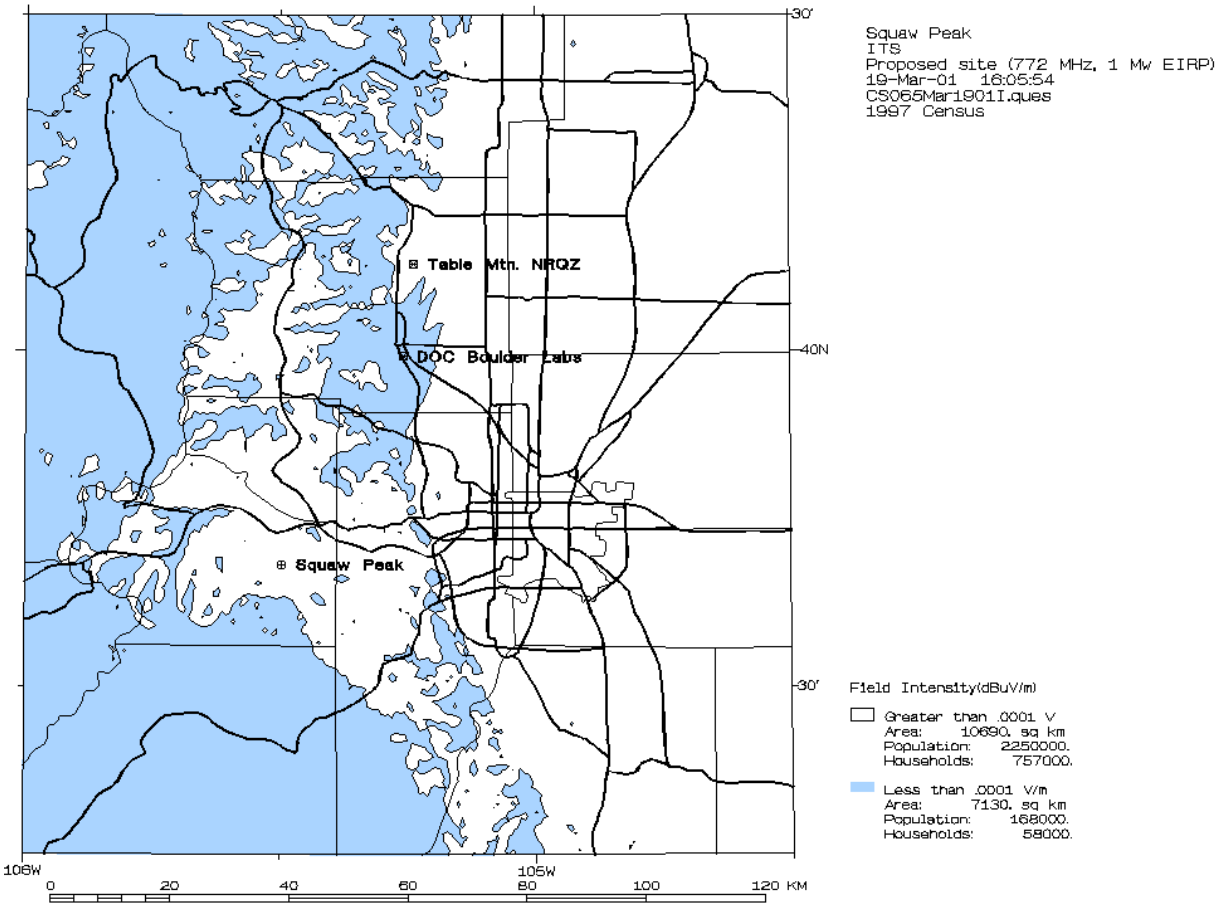

Figure 79. Area coverage plot of the 41 dBµV/m FCC recommendation around the Denver–Boulder area for a horizontally polarized antenna. These results are for a transmitter on Squaw Mountain for a frequency of 772 MHz, EIRP=1 MW, a transmitter height of 60.96 m (200 ft), and a receiver height of 9.14 m (30 ft).

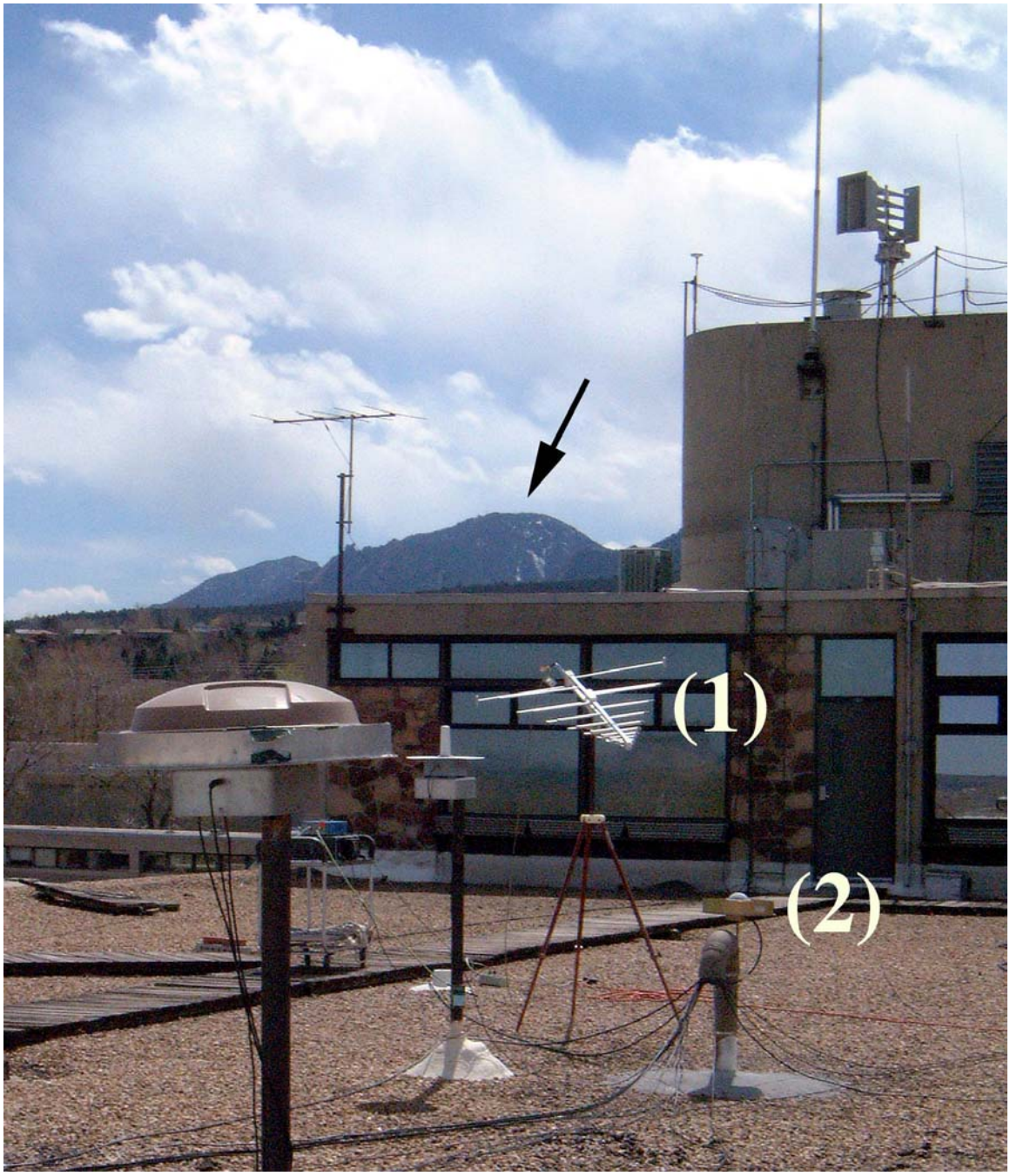

Figure 80. Arrangement of broadband, log periodic antenna (1) used to replicate field intensities predicted from DTV transmitters on Eldorado Mountain (arrow). A GPS receiver antenna (2), located on the NIST/ITS Radio Building at the DOC Laboratories, is the target of the incident field in this test.